THE STORY OF A SURGEON

RUDYARD KIPLING AND THE AUTHOR

THE PHOTOGRAPH WAS TAKEN IN THE QUADRANGLE OF THE MIDDLESEX HOSPITAL WHEN KIPLING ARRIVED TO DISTRIBUTE PRIZES TO THE STUDENTS, OCTOBER 1908

THE STORY OF A SURGEON

BY

SIR JOHN BLAND-SUTTON, BT.

F.R.C.S.

VICE-PRESIDENT AND CONSULTING SURGEON TO
MIDDLESEX HOSPITAL

WITH A PREAMBLE BY

RUDYARD KIPLING

WITH TWENTY-EIGHT ILLUSTRATIONS

METHUEN & CO. LTD
36 ESSEX STREET W.C.
LONDON

First Published in 1930

PRINTED IN GREAT BRITAIN

PREFACE

IN 1908 Rudyard Kipling delivered an address—'A Doctor's Work'—to the students of the Middlesex Hospital, and has ever since taken an interest in its Medical School. He has on many occasions prompted me to write in a personal form the Story of the Hospital. Stimulated by him I venture to offer this *Story of a Surgeon* which centres around the Middlesex Hospital—my Alma Mater. He took the trouble to inscribe with his own hand on the flap of a portfolio, and in quaint English, instructions for such a book. The inscription is so delightful that I use it, with his permission, as a preamble.

This Story tells of the events which led me to enter the Medical School of the Middlesex Hospital, and of my Conversion to Surgery; also of incidents connected with the Dissecting-room, the Museum, the Operating-theatre, and the Wards; and the Transformation of Surgery by discoveries in Anaesthesia, Bacteriology, and Antisepsis. It is enhanced by personal recollections of Surgeons who played a part in the revolution of the most humane art practised by man—Surgery.

Two chapters are devoted to my experiences in the Prosectorium of the Zoological Society, and amusing comedies—and tragedies—connected with wild animals in the menagerie.

Some of these things have lain dormant in my mind many years, and while writing they have recurred with such vividness as to make me feel astonished at having

forgotten them. This experience I learn from septuagenarians is by no means uncommon.

In reflecting on my early aspirations, I am satisfied that TIME has arranged things for me better than I could have managed them for myself.

JOHN B.-S.

March, 1930

PREAMBLE

By Rudyard Kipling

THE STORY OF A HOSPITAL

In which it is to be hoped ſhall be found—a reſonable proporcion—of moſt hiſtoricall matters touching the practice of Our myſteries as it has been uſed at Middleſex ſince the beginning. As well alſo friendly and faithfull Record of the Chirurgeons, Phyſitians, Apothecaries and the like—that dealt in 'em—together with their mere adjuvants, miſtrants, dreſſers and even the poor porters and door-keepers (that Juſtice may be rendered to all)—livelily pourtrayed in their ſpeech—dealings and habits—either by remembrance, tradition or the ſure report of preſent aged witneſſes: not omitting ſome accompt and perſpective of the body material of OUR MIDDLESEX—which iſ to ſay the buildings Thereof—Thoſe changes and betterments neceſſary obliterations of all kinds wherein by the Illuminati may be paralleled, through the plain Allegorie of Brick and Mortar, that unſatiate and upward path of progreſs of Medicine which, like Time devoureth her own children and, no more than terrible Youth itſelf, reſts content with old men nor old ſtuff. The whole got together, pieced out, and here diſplayed—with as much Love as Labour by:—

John Bland-Sutton—Knight and Chirurgeon in his work and heart of MIDDLESEX.

R. KIPLING.

CONTENTS

CHAP.		PAGE
I	Beginnings in Natural History	1
	The Duck-billed Platypus	8
II	Nibbling at Science	11
	The Finger Post: Science—Surgery	21
III	Human Anatomy	26
	Thomas Cooke	26
	Middlesex Hospital	29
	Injuries to the Peripheral Nerves	34
	Practical Anatomy	37
	The Ethics of the Lecture-theatre	41
	Freeman of Bath	44
	The Board Room	49
IV	The Museum	53
V	Surgery	63
	Anaesthesia. Escape from pain	69
	St. Anthony's Fire	78
	The Clinical Thermometer	81
VI	Surgery at Sea	82
	War Surgery	86
	An Adventure on the Bayswater Road	91
	The Solovetski Monastery: Priests as Apothecaries	92
	Amundsen and the South Pole	96
VII	The Royal College of Surgeons of England	98
	Sir James Paget	101
	Puck: and Woolner's Tip	101
	A Valley of Dried Bones	104
	Virchow and Human Tails	107
	Pasteur	108
	Lister	110
	Personal Recollections	112
VIII	The Council of the Royal College of Surgeons of England	115
	Medals	124
	The President's Robe	126
	The Haberdashery of Success	129
	Scarecrows	130

CHAP.		PAGE
IX	The Zoological Gardens	134
	Gizzards	145
	Victor Horsley	147
	Sir Patrick Manson	150
	The Prosectorium at the Zoo	152
X	Zoological Gardens (*continued*)	154
	Teeth	154
	Tusks	155
	Observations on the Psychology of Animals	158
	Baboons	158
	Elephants	159
	Snakes—Frogs	160
	Snakes and Eggs	161
	Snake and Frog	162
	A Snake Problem	163
	Snakes and their own venom	164
	The Tree-Frog	165
XI	Uganda and the Sudan	168
	F. C. Selous	175
XII	The Omnipotence of Zoology	178
	Celestial Creatures—Cherubim	179
	Insects	182
	Fauna of Heraldry	183
	The Celestial Zoo	184
XIII	The Persian Court	185
XIV	Books	190
	I *Ligaments. Their Nature and Morphology.* 1887	190
	II *Evolution and Disease.* 1890	190
	III *Surgical Diseases of the Ovaries and Fallopian Tubes.* 1891	193
	IV *Human Osteology*	194
	V *Tumours, innocent and malignant. Their Clinical Characters and Appropriate Treatment.* 1893	195
	VI *A Treatise of Fibroids of the Uterus.* 1913	197
	VII *A Monograph on Gall-stones and Diseases of the Bile-Ducts*	199
	The Mystery of a Red Lamp	199
	VIII *Selected Lectures and Essays.* 1920	201
	IX *The Principles of Doll-Surgery.* 1922	203

LIST OF ILLUSTRATIONS

PLATE		FACING PAGE
	Rudyard Kipling and the Author	*Frontispiece*
I	Irving's Waterloo Snuff-box	16
II	Demonstration in the old Dissecting-room	40
III	Cosham's Letter	60
IV	The Author, 1914, Major, R.A.M.C.(T.)	88
V	Ear showing Woolner's Tip	101
VI	Woolner's Statue of Puck	102
VII	Truffot's Statue of the Shepherd-boy, Jupille	110
VIII	President of the Royal College of Surgeons of England	118
IX	College Gown and Tassels (*Reproduced by courtesy of the Proprietors of 'Punch'*)	126
X	African Fetish Hut	130
XI	Venus-de-Medici as a Decoy for Rags and Bones	132
XII	Moloch's Caricature of the Author	134
XIII	Man and Chimpanzee	138
XIV	Jumbo fed with Buns	158
XV	Jumbo, peaceful but suspicious	160
XVI	Silvery Tree-snake fascinating a Lizard	164
XVII	Tree-frog (*Hyla blandsuttoni*)	166
XVIII	Plover Chick	170
XIX	Shoebill (*From 'Man and Beast in Eastern Ethiopia'*)	172
XX	Lily-Trotter (Jacana)	174

PLATE		FACING PAGE
XXI	Bathybial Sea-devil	178
XXII	Swordtails (male and female) and Yellow Angler	180
XXIII	Design for a Coat of Arms	182
XXIV	Persian Court, showing the Bull-columns	186
XXV	Persian Court, showing Frieze of Immortals	188
XXVI	Clown drawn by a Lunatic	192

THE STORY OF A SURGEON

CHAPTER I

BEGINNINGS IN NATURAL HISTORY

It is difficult to see the past in true perspective: the years seem almost on one plane like images in a kaleidoscope.

INTEREST in animals is inborn in most of us. Every woman on becoming the mother of a living babe has a delightful object of Natural History to study. My mother was so absorbed in me, especially as I made my appearance two months before the proper time, and so late at night, that neither she nor the midwife remembered whether I cried before, or after, the clock struck twelve. There was some discussion until they decided that the clock had struck the midnight hour before I was born. My father attributed the impatience I manifested throughout life to my premature arrival. In the register of the church, St. James the Great, Enfield Highway, the date of my birth is set down as 21 April 1855. Our house at the bottom of Green Street has long since been pulled down. In recent years the neighbourhood has become populous and changed; so many trees have been cut down, ponds and ditches obliterated, that in 1918, I found difficulty in identifying spots connected with many incidents of my boyhood.

My father was what is commonly called in villages a Naturalist. He was clever in preserving and stuffing

birds, beasts, and fishes. He lived in a house on the estate of General Richard Connop, known as Durants, near the River Lea. The house overlooked the marshes, with a fine view of Epping Forest and Waltham Abbey in the distance. There was a fine grove of trees called the Wilderness, with thick under-bush which afforded excellent cover for birds. A moat served as an asylum for wild duck, moorhens, and occasionally a heron. The old trees harboured owls and woodpeckers. The outhouses were nesting-places for swallows and martins, and as small birds were numerous hawks abounded.

No preserves, but partridges laid eggs and hatched them in the fields. Foxes visited the place as well as poachers, and occasionally a polecat. There was a notice-board over the stables which I used to read with astonishment:

Man traps and spring guns are set
on these premises.

Notice-boards of this kind are now museum curiosities.

Our house had a nice paddock which served as a play-ground. This was useful as the family increased by annual instalments to nine. Two girls and seven boys. The first child was a girl. I was the second child, the smallest and weakest. All my brothers but one grew up to be strong men. I remained at 5 feet 7 inches, small in bone, short in limb, weak in muscle, and always ailing and easily duped, but I learned wisdom in the stern school of experience. In consequence of my indifferent health and lack of physical strength, I was left much to myself, but took great interest in watching animals of all kinds. In a reading-book at school I was astonished to learn how Professor Owen reconstructed the femur of the moa from a fragment of its shaft found in New Zealand. Also the startling discovery of a mammal

that had a beak and feet like a duck and laid eggs. This extraordinary animal, named platypus by Dr. George Shaw in 1799, was reported to lay eggs like a bird, but naturalists were not convinced until its egg-laying habit was established by W. H. Caldwell in 1884. At the present time a stuffed platypus is as common in English homes as a stuffed owl or a woodpecker. English settlers in Queensland, astonished by this animal with a beak like a duck, and webbed feet, sent it to their relatives and friends in England as a curiosity.

Books on natural history and travel had great charm for me. I began with the Pentateuch, the *Swiss Family Robinson*, *Gulliver's Travels* and *Robinson Crusoe*; my interest culminated in Darwin's *Voyage of the 'Beagle'*, Humboldt's *Travels*, and Wallace's *Malay Archipelago*.

I derived great pleasure from Swift's account of Lilliput, and the floating island Laputa. The comedy of the Big-endians and Little-endians is delightful. In later years, in the embryology class, discussing the condition of the chick in the egg I occasionally referred to the egg-dispute and mentioned that the neb of the chick, just before hatching, projects into the air-chamber at the broad end of the egg. In spite of that, at the breakfast-table, I was a Little-endian. One day a witty student remarked—the chick was wiser!

ENVIRONMENT

The surroundings in which I lived were such as would make a boy interested in Natural History. My father was not only admired as a naturalist by his neighbours, but he had a local reputation for grafting fruit-trees and rose-trees. He extracted children's teeth, stitched wounds, and charmed warts from the hands and fingers of boys and girls. All sorts of curious natural history specimens were brought to him, such as leverets with

two heads; rats and rabbits with overgrown incisor teeth; chicks and ducklings with an extra head, wing, or leg; albino birds and moles.

I watched my father skin a partridge, and as he cut off the head of the bird I noticed the hole in the skull through which the spinal cord passed to the brain. He replied to my question: This hole is called by anatomists the great occipital hole or foramen.'

This was my first lesson in Anatomy.

On another occasion, when gutting a pheasant, he showed me its spleen, and explained that surgeons had removed the spleen from dogs and they lived and throve without one.

This was my first lesson in Physiology.

Later in life, when removing spleens from patients, I recalled that early lesson, and was the first surgeon to remove a wandering spleen successfully. It is true that human beings can live without a spleen, and there is an idea that the spleen is more useful in children than in adult life. Certainly in old age the spleen dwindles and becomes very small. In 1895 I removed a spleen from a girl aged 5 years; it was thrice its normal size and associated with marked anæmia. This is, I think, the youngest patient submitted to splenectomy on record. The girl was a twin. Eighteen years later I received a photograph of the twin-sisters from their mother. The spleenless sister was as well developed and as healthy as her sister, and had become 'an attractive woman'. Their father had a printing business, and my quondam patient earned a living as a compositor in her father's establishment.

My father picked up odds and ends of medical knowledge from a retired physician, Dr. Thomas William

Jones, who lived near us. He taught him how to dispense medicine, and we were regularly dosed in consequence. This bred in me a dislike for amateurs in any profession.

Our rooms and the outhouse were filled with bird-skins in various stages of preservation. We kept many live birds. Owls interested me most; they looked so like judges in wigs and spectacles! Owls also lived in the trees around us; their hooting scared my mother, who was superstitious. I was sorry the owls caught shrew-mice, for I liked to play with them:

Smallest mammal pigmy shrew-mouse
Often I caught one near the house
Under a cedar old and grand,
It did not struggle in my hand;
I lik'd to feel the soft muzzle
By means of which shrew-mice nuzzle,
Under leaves, fallen trees and shrubs,
For insects and worms, slugs and grubs.
Shrew-mice have soft fur, small pink teeth,
Long snout, long tail, small hands, small feet;
Ears that close with a fold of skin,
Useful for shrews that delve or swim;
Last, but not least, a cheesy smell!

How this was got let Balzac tell:

Gargantua set a shrew-mouse
To guard the good food in his house,
Such as butter, game, and crush'd peas,
Pig's trotters and over-ripe cheese;
The giant for fun in the dusk
Dipped the shrew's nose in oil of musk!

As moths, butterflies, and brilliant beetles were used to decorate the cases of stuffed birds, they were caught and preserved. We obtained caterpillars and pupæ in the summer and autumn to be kept for the imago-stages in spring. I was deeply interested in the huge caterpillars of the Death's-head moth found in potato fields, and,

filled with wonder, watching the moth emerge from its pupa-case and slowly unfold its big wings!

Collectors of butterflies and moths have great difficulty in securing large specimens fit for cabinets, because they flutter and struggle so violently when caught, and thus damage their wings irretrievably. In order to obtain good examples of large forms, such as the Death's-head moth, it is better to obtain the chrysalis, then by patient watching, and some experience, it is possible to foretell almost to an hour when the imago is likely to emerge. When this happens, and after the wings have expanded, a drop of cyanide of potassium solution applied to its mouth quickly kills the moth without damage to the wings. The lethal effect of the cyanide was new to me.

This was my introduction to Toxicology.

I remember my mother being disturbed when a nest of hornets was discovered in a turreted gate-post near my paddock, and persuaded my father to destroy it. He managed to trap the hornets in a glass-bell jar. I remember watching the swarm in the jar and was astonished at the way they buzzed in strange commotion. A fold of cotton-wool saturated with chloroform was pushed into the jar; the hornets quickly died.

This was my first lesson in Euthanasia.

Many events apart from watching the conversion of aquatic tadpoles into amphibious frogs quickened my interest in the reproduction of animals, including worms, flies, ants, moths, butterflies, fishes, reptiles, birds, beasts, and human beings. The subject fascinated me, and it is difficult to describe which astonished me most—an oak from an acorn or a colt from a mare.

This rough-and-ready beginning in the Elements of

Animal Reproduction was useful when I began to study Balfour's *Embryology*.

It is one thing to acquire a knowledge of the Physiology of Sex in a Laboratory, but the interest is enormously increased when the subject is studied in relation with the external manifestations. It surprised me to learn that some fishes at certain seasons blaze with colours. My first lesson on the marriage colours of fishes came at the age of nine. I saw a gloriously iridescent stickleback darting among the weeds of a brook, near its nest. I caught the fish and gleefully transferred it from the net to the fish-jar, and hurried home in triumph. Next morning my dejection was profound on finding that the colours had faded, like the evanescent colours of the rainbow, leaving my fish as dull as a sunless sky. Such brilliant sticklebacks are known to the village boys as 'cock-robins'. Many years afterwards it dawned on me that this exquisite sheen is the marriage decoration of the male stickleback.

I have mentioned the odd zoological curiosities which were brought to our lodge such as ducks and chicks with an extra head, leg, wing, or a double-toe. These things stirred in me an interest in malformations. When I became a medical student, Dr. T. W. Jones, who in his early days studied Medicine in Paris, gave me a copy of Isidore Geoffroy Saint-Hilaire's book entitled *Des Anomalies de l'Organisation chez l'Homme et les Animaux*, which stimulated my interest in monstrous animals of all kinds—real and imaginary.

Embryology has thrown much light on malformations and so-called monstrosities. It has raised Teratology from the freak-museum to the Biological Laboratory, where the experimental production of malformation and double embryos among sea-urchins, star-fishes, fishes, and tadpoles, has become a familiar exercise.

The extensive collection of Animal Teratology in the Royal College of Surgeons of England, assembled by John Hunter, was in his day, and for a century later, little better than a freak-museum. It contained giants and dwarfs; fishes and reptiles; birds and mammals with double heads, reduplicated limbs, bifid tails, supernumerary fingers and toes.

To-day Teratology is an important branch of Embryology, and its experimental study has thrown light on the presence of certain tumours (Teratoid) which occasionally occur in every cavity of man's body—cranial, thoracic, or abdominal.

The discovery that ductless glands in our body constitute a Glandular Pantheon by which the growth and well-being of Man is controlled, supplied the secret underlying the production of giants and dwarfs.

THE DUCK-BILLED PLATYPUS

In the middle of the nineteenth century it was taught in schools that Australia and New Zealand were not only antipodean to the British Isles geographically, but also zoologically. I was confidently taught that a mammal called the duck-billed platypus lived in Australia and had a beak like a duck, webbed feet, and laid eggs like a bird. The swans were black; and in New Zealand there lived a bird—the kiwi, which had wings but could not fly. In addition to this topsy-turvydom among beasts and birds, the stone of the native cherry grew outside the fruit.

In 1884 I was Lecturer on Comparative Anatomy at the Middlesex Hospital Medical School and confidently taught these things. My astonishment was great when a laconic telegram was received in London from Australia to this effect,

Monotremes oviparous, ovum meroblastic!

This telegram was read 2 September 1884 to the British Association, then in session at Montreal. It appears that previous belief in the oviparous habits of platypus was not well founded. Mr. W. H. Caldwell was sent to Australia to collect material for the study of the Embryology of Monotremes and Marsupials. On 24 August 1884 he shot an Ornithorhynchus (platypus) whose first egg was laid and her second was in a partially dilated *os uteri*.

Caldwell established the fact that platypus is an oviparous mammal. The egg resembles that of a reptile, and has a leathery and partially calcified shell. It is equal in size to a sparrow's egg, but its poles are rounded. This observation settled a question which had been debated by zoologists ever since Shaw introduced this odd animal to the notice of naturalists in 1799; nevertheless it remained uncertain whether the eggs were hatched in the maternal passages or incubated like those of birds.

It is now established that the eggs are laid in a nest at the bottom of a deep burrow—and incubated by platypus. The nest is made of the rhizomes of couch grass, branchlets of willows, dried eucalyptus leaves, and twigs of the she-oak, etc. There are some nests and eggs well displayed in the Natural History Museum, London.

For the knowledge of the nesting and incubating habits of platypus we are indebted to the energy and admirable field-work of the Australian naturalist, Mr. H. Burrell. His observations were published in an excellent book—*The Platypus*, 1927.

The tale of the cherry with the stone outside of the fruit admits of an easy explanation. A tree named *Exocarpus cupressiformis* is about 20 feet high with filiform and apparently leafless branches—the leaves being

reduced to minute scales. The flowers are inconspicuous. Its fruit is small and nut-like, not unlike a cherry-stone, and is seated on a fleshy red foot-stalk. It resembles a small cherry, is edible, and though astringent to the taste, it is not unpleasant. To the colonists the plant is known as the Australian cherry.

'This is the poor little fruit of which so much has been written in English descriptions of the peculiarities of the Australian flora and fauna. It has been likened to a cherry with the stone outside by some imaginative person.' (J. H. Maiden.)

Black swans have long been familiar and picturesque birds in zoological gardens in Europe.

CHAPTER II

NIBBLING AT SCIENCE

MY mother was the eldest daughter of Joseph Wadsworth, at one time a prosperous farmer in Northamptonshire. He had a large family, but became intemperate, and this involved him in ruin. His wife died while the children were young; my mother, being the eldest daughter, the care of the family devolved on her; she was a most industrious woman and fond of children. This was her favourite maxim: 'Work is an honour, a duty, and a daily privilege.'

My grandfather married Miss Bland, the daughter of a neighbouring farmer. The Bland family helped my mother in her difficulties, and in recognition of such help I was christened John Bland. As the family increased it was difficult to live. The relations of my mother helped us, and in return dominated the family in everything, including religion. Their views were narrow; to enter a Roman Catholic church or a Nonconformist place of worship was, to them, equal to holding converse with the Devil.

In due course I went to school and picked up the rudiments of knowledge quickly, and mischief quicker. I liked school, but preferred to wander about the fields, orchards, and lanes; or watch the threshing of corn, the thatching of ricks, and the repairing of fences; clearing ditches, trimming hedges, cutting down trees, and splitting logs; helping to shoe oxen and horses; pulling

the bellows at the village forge, or blowing the organ at the church.

A weakly lad, I made a poor show at sports such as running, jumping, cricket, and the like. I loved to catch butterflies, shoot rats and hares, and learn to recognize birds by sight, flight, and sound; and to study their courting and nesting habits. It was great fun to set snares for hares, and traps for rats, moles, and polecats; and to go out at night with nets to catch small birds for our hawks and owls. On summer evenings we were enchanted with nightingales; these birds occasionally nested in the Wilderness and laid olive-green eggs in a nest in the ivy, around a tree-trunk, near the ground. I was especially fond of the wren:

> Familiar wary Jenny Wren
> With brown feathers and upturn'd tail,
> Flitting in and out of bushes,
> Or pertly perching on a rail.

It amused me that many of our friends had names of birds for surnames. The sexton and the pew-opener were Swallow and Wren. This amused the choristers, and one of them wrote this rhyme:

> Jenny Wren said to Johnny Swallow,
> 'You fly, I will follow';
> Johnny Swallow said to Jenny Wren,
> 'You fly, I'll follow then!'

He showed it to the sexton. The crusty old fellow threatened to box his ear!

In spite of this freedom and love of Nature I made some progress at school; and quickly learned to read and write neatly. By accident I discovered in an old chest in my bedroom some unbound numbers of an illustrated Bible. The parts included the Pentateuch, the Books of Samuel, the Kings, and the Chronicles of the Kings

of Israel and Judah. The pictures of the Tabernacle and the Ark of the Covenant charmed me. Whenever punished for any childish misdemeanour I was locked in the bedroom. The hours of domestic imprisonment I beguiled in studying these books.

My literary education began in the study of the Old Testament. All my life I have read the Bible for literary style, and this bred in me a keen critical interest in religions which later in life stimulated me to travel in Egypt, Italy, Palestine, Syria, Turkey, India, Spain, and Mexico.

The Wanderings of the Israelites in the Wilderness of Sinai and the Apostolic Journeys of St. Paul are full of interest, but it was my love for animals and birds that led me to visit British East Africa, Uganda and the Sudan, Rhodesia, and the Amazon. In August 1922, at 2 a.m., whilst entering the mouth of the Amazon, I was on deck with the Captain and had the good luck to witness an extraordinary shower of meteors, such as Humboldt saw in 1799 at Cumana.

Occasionally I stayed with my mother's relations in London. They were strict in observing Sunday: regular attendance at church, and the reading of novels banned. Hymns were sung after the evening meal. When I had a cough and made it an excuse for abstaining from church service, I had to read the lessons aloud to my aunt, who was old and paralysed; when the lessons were short, the psalms for the day were added.

I was not allowed to visit theatres. I remember walking round Sadler's Well in 1869 when Samuel Phelps returned there for a season. The people crowded the doors nightly and many were turned away. I had to be content with reading his name on the play-bills.

It was natural that I should wish to see a Shakespearian play; at school the master trained us to mem-

orize famous speeches from *Hamlet*, *The Merchant of Venice*, *Macbeth*, *King Henry VIII*, *Julius Caesar*, and declaim them.

The last two years I attended school I was a pupil-teacher in training for a schoolmaster, with an examination conducted yearly by the Inspector of Schools. It was part of the schedule that the teacher should repeat fifty lines of poetry from a selected author. On one occasion my task was to memorize fifty lines from Scott's *Lady of the Lake*. The selection was from The Combat in the Fifth Canto; Fitz-James, Roderick Dhu, and the scene at Coilantogle Ford. When the hour came for me to repeat these lines, the Inspector conducted me into the Girls' School and I had to declaim the lines to the whole school. This was admirable training, and in after-life very useful. I always committed my lectures and addresses to memory, and could do it easily and quickly. It became so much a habit that if I attempt to read anything to an assembly I invariably lose the place.

I was 29 when I saw a play. It was *Hamlet*, with Wilson Barrett as the Prince of Denmark, at the Princess's Theatre. This made me a theatre-lover for the rest of my life. I have seen every Shakespearian play performed.

The last was *Titus Andronicus* at the Old Vic, 1923. The play ran two weeks. So realistic was the acting that women fainted in the theatre at almost every performance. The part of Aaron the Moor, beloved by Tamora, the Queen, was cleverly played by George Hayes. When he drew his scimitar to cut off the hand of Titus, the swish could be heard all over the theatre.

I had the good fortune to see Henry Irving in nearly all his plays. Nothing left such a deep impression on my mind as his performance of Mathias in *The Bells*. It happened that Toole had a special evening perform-

ance of an extremely whimsical farce called *Domestic Economy*; this was followed by a performance of *The Bells*. The house was crowded in every part, but I managed to obtain standing-room in the pit. I have often reflected on this, and believe the weirdness of the dream scene was intensified by seeing it at a moderate distance. All through this scene the sound of the sleigh-bells haunts Mathias—and the audience. In spite of the years that have passed the sound of bells haunts me. When I lived in Gordon Street, near Euston Station, the horses of hansom cabs often wore sleigh-bells. In the stillness of the evening when writing in my room, on hearing the sound of cab-bells, I instinctively laid down my pen and listened to their tinkle. These impressions were intensified during a Christmas Season in St. Petersburg. In that fine city I listened to the sound of the bells as the sledges glided over frozen snow. I cannot efface the sound—and have no wish to efface a sound which revives the mental picture of that wonderful scene.

Many years after seeing *The Bells* I became acquainted with Ellen Terry and she gave me some interesting mementoes, among them the snuff-box which Irving used in his performances of *Waterloo*. The box has on the lid a cameo portrait of Napoleon; also a secret bottom which takes off like a lid, and in its concavity—an excellent photograph of Ellen Terry, and on the back of it is written in her peculiar handwriting, 'A Very Strange Lady' (*Plate I*). In the latter period of her life I always listened with interest to many delightful stories she told of the stage, including the following:

Charles Kean produced a series of gorgeous Shakespearian revivals at the Princess's Theatre, of which he was lessee. In 1856 he produced *A Midsummer Night's Dream*, and Ellen Terry, aged 8, played the merry

goblin—*Puck*; she appeared out of a trap, seated on a toad-stool. One evening as she came up, the door was dropped too quickly and pinched her toe, which made her cry! Mrs. Kean rushed to the wings and said: 'Be a good girl, go on and finish the part, and I will give you a bun!' Ellen dried her eyes and soon delighted the audience with Puck's song, beginning

Now the hungry lion roars,

When the curtain came down Mrs. Kean brought behind the scene F. C. Skey, who happened to be in the theatre. He attended to the little girl's foot, and as she had been so good he promised to show her round St. Bartholomew's, the biggest hospital in London. He kept his promise. Skey was surgeon to St. Bartholomew's and a favourite pupil of Abernethy. He was very fond of the theatre and, though a surgeon, published some *Lectures on Hysteria* which ran through three editions.

One fine summer afternoon Ellen Terry was walking with Rossetti in his garden; she saw a tortoise on the lawn and asked him: 'Why do you keep a tortoise?' He replied, 'To eat blackbeetles.' Thoughtlessly with her foot she gently turned it over—and was horrified when a score of beetles issued from the tortoise!

It is by no means uncommon for a medical student to find the work of a surgeon uncongenial and abandon Medicine for the stage. Sir Charles Wyndham studied Medicine and became a Member of the Royal College of Surgeons of England. He served with the Federal Army in the American War, and at its conclusion left the service and became an actor. He was very successful on the stage and made a name, and a fortune, in Comedy. I saw a good deal of him, as my wife's mother was his cousin. I had the privilege of being present at many 'first nights'. I possess an unusual token of the

IRVING'S WATERLOO SNUFF-BOX

Mendelssohn, Handel, Mozart, and Beethoven. My interest in church music began early. The schoolmaster was organist to the church, and it had a local reputation for its musical services. Music charms me. During my holidays in London I spent delightful hours in St. Paul's Cathedral, Westminster Abbey, and the Temple Church, on Sundays and Church Festivals listening to the music and singing. The chanting of psalms in the Abbey had great delight for me. In this way I acquired a knowledge of the Prayer Book and Church ritual. Later I became deeply interested in Anatomy and Biology; the current ideas of Heaven and everlasting life ceased to appeal to me.

In 1922 Flammarion, the astronomer, published, when he was very old, a book on *Death and its Mystery*. The editor of the *Morning Post* asked me to review it, and at the end of the review I took the opportunity of expressing my opinion on this much-debated question in four simple lines:

> In the dim future do not seek to peep,
> Trying to fathom things obscure and deep;
> Youth often laughs at death, but old men weep,
> Wise men know death to be an endless sleep.

On one of my visits to London I was taken to John Hunter's house at Earl's Court and shown the den where he kept wild beasts in order to study them. This visit in 1865 left a deep impression on my mind, for I was fond of animals. Ten years later it came vividly to my mind on finding a dilapidated copy of Ottley's *Life of John Hunter*. This I read eagerly. Ever since I have been deeply interested in all that relates to the life and work of this extraordinary man. My interest culminated in 1922 when I was nominated Hunterian Orator at the Royal College of Surgeons. The preparation

and delivery of the oration, 14 February 1923, in the theatre of the Royal College of Surgeons, was a delightful and engrossing exercise.

In my twelfth year I became an omnivorous reader; Geography, Scripture, History and English Literature appealed to me. Another favourite book was the *World of Wonders*, and in it I read with astonishment, 'Yeast is a plant!' About this time I found in a disused cupboard a book on Physical Geography; the section on Astronomy awakened a new interest, leading me to study the constellations, identify the important stars and watch the planets. While on a visit to London I went to the Polytechnic Institution and listened to a lecture on Electricity. The experiments with a gigantic battery of Leyden jars excited me to procure a book on Electricity. I not only studied the book carefully, but managed to construct some simple pieces of electric apparatus with which I could decompose water.

Walking from Islington to the Polytechnic Institution I saw the Middlesex Hospital for the first time. It was 7 p.m. on a winter's night; its grand front all aglow made a delightful picture which has not faded from my memory. I little thought that the greatest part of my life would be passed within its precincts. From 1870 to 1873 I worked hard at Physical Science, stimulated by the perusal of Sir John Herschel's *Study of Natural Philosophy*. This gradually led me to perceive that success in this department of knowledge demands skill in mathematics.

Any form of knowledge in which a man can hope to win success must be something which he acquires easily —and retains. Mathematical ability! I had none, and in consequence abandoned the idea of being an astronomer. My admiration for Astronomy remains. The calculation of a comet's orbit and the prediction of the

exact minute of its return, appeals to me as a supreme test of human intellect.

Nothing gave Fresnel so much pleasure as the discovery of a theoretic truth; or the confirmation of a calculation by experiment. There is a story current to the effect that Leverrier was once in the observatory with Flammarion, who at that moment had the planet Neptune showing in the telescope, and asked Leverrier if he would like to see it. He replied, 'No. I have never seen it.' He had discovered its position by mathematics, and except for mathematics he had little curiosity. To me such an attitude of mind is incomprehensible.

The brain of man is a wonderful organ and no one has solved the manner of apportionment of its grey matter, or determined the amount which will equip a human being to be a poet, prophet, philosopher, or pathologist. The grey matter required for a mathematician must be in quantity extreme and in quality supreme.

My inability to appreciate mathematics, or mental operations in which numerals, ciphers, or symbols are concerned, was to me an embarrassment. I conducted chemical experiments, yet failed to grasp the atomic theory or a problem expressed in symbols. I appreciate the ability of the man who invented the symbol O for zero, and especially its use on the left side. To-day, it is used in this way on the identification plates of motor-cars! and for telephone addresses!

Formulæ expressed by groups of hexagons, with letters and numbers attached, so common in organic chemistry, are incomprehensible to me. To my mind they suggest a piece of honeycomb floating in water and tugged by tadpoles!

I attended a meeting at the Royal Society when Lord Kelvin was President; and in the course of a discussion

he wrote a formula on the blackboard to express the difference in the rate of motion of atoms in a beam and in a ray of electric light. The confidence with which he expressed this opinion amazed me.

My scientific toys were a magic lantern, a telescope, and a microscope—each in turn a birthday present. I preferred the microscope and examined such things as pollen, leaves of plants, wings of butterflies, and insects —especially fleas. It did not occur to me in those days that such apparently insignificant insects as the flea and the fly were conveyers of disease and death, and that I should write of them fifty years later:

> There is nought to choose between you
> Flea and fly, gnat and snail;
> The millions yearly killed by you
> Make men and women quail.

Later the corpuscles of the blood attracted my attention. I read keenly Carpenter's book on the Microscope, especially the opinions held by microscopists in regard to the shape of the red corpuscles and the protean forms assumed by the leucocytes. Not content with merely learning the use of optical instruments I was keen to obtain a knowledge of the principles of lenses. This led me to study books on Light, and Vision; but I made little headway and failed to grasp the principles involved in the Science of Optics.

Any form of knowledge in which a man—or woman —can hope to win success must be something which he acquires easily—and retains.

THE FINGER POST: SCIENCE—SURGERY

In spite of diligently reading books on Natural Philosophy I never relaxed my interest in Natural History; it extended to the quaint creatures carved on cathedral stalls and gargoyles on castle walls. The study of an

astronomical atlas with the constellations represented as mythological heroes, quaint beasts, reptiles, and fishes gave me much pleasure. The sky on a clear night is a Celestial Zoo (see p. 184).

In 1874 I became a subscriber to *Nature*; this journal was then in its fifth year of publication. I read with keen interest a series of articles on contemporary scientists illustrated by excellent portraits. I was specially delighted with those of Huxley, Darwin, and Tyndall, and mounted them in a group and hung them on the wall of my study. My relatives were amused at my interest in these portraits and styled the group the Atomic Trinity.

I read Tyndall's Address to the British Association at Belfast in 1874 with great care. This address made a stir in what was called at that time, the conflict between Science and Religion, really a sequel to the publication of Darwin's *Origin of Species*. My conversion was complete. I obtained Huxley's *Lessons in Elementary Physiology*, Oliver's *Lessons in Elementary Botany*, and Mivart's *Lessons in Elementary Anatomy*, and worked hard to master them. Another book which I eagerly absorbed was Winwood Reade's *Martyrdom of Man*.

My father occasionally complained of the inconvenience of his large family, and on one occasion I reminded him of the opening sentence of Oliver Goldsmith's charming tale, *The Vicar of Wakefield*:

> 'I was ever of opinion that the honest man who married and brought up a large family, did more service than he who continued single and only talked of population.'

In 1876 I was walking down the City Road, Islington, when a man thrust into my hand a small but neatly printed pamphlet, called *Fruits of Philosophy*. This was an American pamphlet dealing with the Question of Population. The publisher was indicted for publishing

this book as it contained what in those days was regarded as indecent matter. He was lightly punished for the offence. Charles Bradlaugh and Mrs. Besant took the matter up, republished and freely circulated the pamphlet. Bradlaugh was prosecuted—fined, and sentenced to imprisonment. The sentence was ultimately set aside on a technicality. Much resentment was manifested against Bradlaugh, not only for the part he played in distributing the *Fruits of Philosophy*, but also for his avowed atheism.

This matter made a deep impression on me, and at the time I was engrossed in reading Kirke's *Physiology* I was astonished at the attitude displayed by my friends in regard to what is now called Sex-Physiology. Naturally after reading and meditating on Bradlaugh's pamphlet I turned to the celebrated work of Malthus on *Population.* Subsequently I learned that Darwin (who read this book for amusement in 1838) was largely influenced in his studies on the *Origin of Man* by Malthusian ideas; indeed the phrase 'The survival of the fittest' was used by Malthus.

Darwin demolished the idea of the Divine Origin of Zoology, but cautiously kept the religious side of his theory in the background; his view on Creation is excellent:

> 'Genesis is a repository of venerable traditions of unknown origin, claiming no scientific authority and possessing none.' (*Life and Letters* Vol. II, p. 181.)

In my student days the attitude of many pious persons to Charles Darwin's *Origin of Man* was akin to that shown by the public to the opinion of Charles Bradlaugh on the Question of Population. Time has vindicated both men, but with a difference: Bradlaugh was prosecuted for blasphemy, but happily not imprisoned.

Darwin outlived obloquy; when he died his body was honourably, and with great solemnity, interred in Westminster Abbey. An impressive statue of this great naturalist adorns the Natural History Museum, South Kensington.

To-day Sex-Physiology in relation to human beings is discussed as freely as the breeding of race-horses, and dogs; such books bring much gain to their authors!

On comparing Biology with Physics I came to this conclusion:

The ways of Zadig had more interest for me than the Logarithms of Napier.

This decision was reached as the result of a painful experience: While skinning an animal, a clumsy assistant stuck the point of a knife into the middle finger of my right hand. In a few days I was acutely ill with sepsis. My finger remains flexed at a right angle to this day. Dr. William Henry Day explained to me the nature of the injury and lent me a dried dissection of the forearm and hand. I soon mastered the muscles, tendons, and blood-vessels. This turned my attention to Human Anatomy; I determined to be a surgeon, feeling convinced that my knowledge of Comparative Anatomy would be useful. Having made up my mind and with a goal in view, I set to work in real earnest to earn the fees for the hospital course. Four years later (1878) I passed the Arts Examination, including the four extra subjects required for the Fellowship of the Royal College of Surgeons of England. From the optional list of subjects I selected French, Greek, Chemistry, Botany and Zoology. Six years later (1884) I was a Fellow of the Royal College of Surgeons of England.

I selected Greek as an optional subject because of the help it affords in understanding the significance of

scientific names in Anatomy, Zoology, and Botany. I worked it up for the examination with the help of a grammar, lexicon, and Xenophon's *Anabasis* and the Gospel of St. John. My father was so pleased with my success in Greek that he gave me a small—very small—sum of money. This was the only financial aid I received from him after leaving school.

In subsequent years as a demonstrator I found it was easier to teach Human Anatomy to students who had acquired some knowledge of Greek, than to those who did not know even the Greek alphabet. Many students of more than average ability describe Human Anatomy as 'an infernally difficult subject'. John Hunter was ignorant of Latin and Greek, and this defect hampered him in his scientific writings.

CHAPTER III

HUMAN ANATOMY

THE selection of a Medical School was for me a matter of serious consideration: I had the fees in my pocket but no one to guide me. Knowing well the importance of Anatomy and ascertaining that dissecting-rooms at that date (1878) were not open in summer, I remembered reading in a newspaper an account of a private School of Anatomy in Blackfriars, run by Mr. Thomas Cooke. The dissecting-room was at the top of a house; one evening the neighbours were startled by a hearse which pulled up at the wrong house and the undertaker said he had brought a 'subject'. This led to police-court proceedings and Cooke had to remove his school. Tommy Cooke, he was familiarly called by his pupils, was a resourceful man, and when the tumult subsided he obtained a lease of the disused burying-ground of St. George the Martyr, immediately behind the Foundling Hospital, and parallel with the old burying-ground of St. George, Bloomsbury. Cooke built a large shed, of wood and corrugated iron, which served as a dissecting-room, and classroom, which he called The London School of Anatomy.

THOMAS COOKE

Thomas Cooke was a curious man. He was born in America 1841, and went to Paris at the age of 13. There he studied Medicine, took a degree, and became

Demonstrator of Anatomy at the École Pratique de la Faculté de Medicine. He experienced great hardships in Paris during the Franco-German War, came to London in 1870, and obtained the Fellowship of the Royal College of Surgeons of England in 1871, passing the Primary and Final examinations within a month. Cooke was appointed Assistant-Surgeon to the Westminster Hospital, and in order to make a living started a private school of Anatomy—Cooke's School. It was his aim to coach men for examinations and he wrote a series of cram-books familiarly known as Cooke's Tablets. These were set up and printed in his own house.

I took a six-months' ticket at this school in March 1878. Cooke was an admirable teacher and had a system of his own, teaching over the freshly dissected body; and the course was so arranged that the whole of the body was quickly reviewed in a course of three months. With a good class there was a brisk round of questions and answers for an hour, often enlightened with sallies of wit and repartee, brilliant and delightful.

Dissecting proved easy and absorbing. Cooke soon arranged with me to dissect for the class and offered to make me a demonstrator with a stipend. This I refused; but we remained excellent friends.[1]

Cooke died suddenly at the age of 58, whilst conducting a class in the dissecting-room, 8 February 1899.

[1] In Cooke's dissecting-room I met several interesting men who came to 'brush up' their Anatomy. Among them W. G. Grace, famous as a cricketer. W. G. was preparing for his final examination at the Royal College of Surgeons. Like most English boys I was fond of cricket. At Durants we had our own field. I did not play well, and discovered—later in life—that my bad batting was due to the habit of unconsciously closing my eyes when trying to smite a moving ball. Even when conscious of this habit I could not overcome it; consequently I was useless in a match—except to keep the score.

His death, impressive and tragic, recalled the end of Molière. My initiation into Human Anatomy by Thomas Cooke was of the greatest service to me. I wrote a short appreciation of him for the *British Medical Journal* and could not resist adding Omar Khayyám's fine quatrain on Human Destiny:

> 'Tis all a Chequer-board of Nights and Days
> Where Destiny with Men for Pieces plays:
> Hither and thither moves, and mates, and slays,
> And one by one back in the Closet lays.

When Cooke died, Destiny removed from my Chequer-board one who played an important part in the initial act of my life as a surgeon. In his small dissecting-room of corrugated iron and wood I appreciated the importance of learning anatomy in the only way it can be usefully acquired, and this is by dissection. I also learned the importance, for teaching purposes, of carefully dissected preparations of difficult anatomical regions.

From the very beginning of my career as a teacher I always taught from the 'subject' and with firm faith in the objective method. Perhaps I overvalue this method of teaching because my knowledge of the external world is purely visual. I must see things to understand them.

In converse over the fire in the Common-room students often discuss their reasons for preferring the particular Medical School in which they find themselves. When hard at work in Cooke's quaint school much kind advice was proffered in regard to the choice of a school. Whilst turning the matter over in my mind, I read the account of a trial at the Old Bailey, in which a man was tried for stabbing another. The victim was conveyed by policemen to the Middlesex Hospital. The House-Surgeon at once operated on him and saved his life. At the trial the Judge sentenced the prisoner to a long term of imprisonment. In passing the sentence, he said: 'The

skill of the young House-Surgeon had not only saved the life of the wounded man, but also that of the prisoner, for had the poor fellow died, the prisoner would most certainly have been hanged.' The Judge's commendation appealed to me. A Medical School which could turn out such a clever man would suit me—I joined the Middlesex Hospital.

MIDDLESEX HOSPITAL

On 25 April 1878 the Dean, Mr. Andrew Clark, admitted me a student of the Middlesex Hospital Medical School: I paid the fee which made me a Perpetual Student, and remained a lifelong student of the Hospital. The money was counted out in sovereigns. Some years later, the Dean told me that he put the money in his pocket, and on the way to the bank all the coins slipped through a hole in his pocket and fell on the pavement. During the summer session I attended the lectures on Botany and won the class prize. We were allowed to choose our prizes and I astonished the Dean, a good churchman, by asking for Darwin's *Origin of Species*. He thought it was unwise of me to read such a book, and discussed the matter with the Treasurer, Dr. William Cayley, but the Treasurer approved the choice and said there would be enough money for two books. For the second, I chose Dante's *Inferno*.

All through the summer session and the vacation I steadily dissected at Cooke's School, and at the beginning of the Winter Session Cooke gave me a letter of introduction to Henry Morris, the Lecturer on Anatomy. In those days the Anatomy lectures were delivered by a member of the surgical staff. Morris at once made me a prosector. In the following year I was appointed Demonstrator with a small but useful emolument. In this capacity I had to coach students for their examinations

and enjoyed the anomalous experience of 'going up' for my examination in anatomy at the Royal College of Surgeons with my own class.

In those early days I was occupied in the dissecting-room, and in the museum; also conducting private classes, and coaching men for the examinations at the Royal College of Surgeons. As these were the sources of income by which I lived, it was impossible to go into residence as a house-surgeon, and this was for me a matter of lifelong regret. In the days when I began my hospital studies the high road to the surgical staff was through the dissecting-room. Many brilliant operators were supposed to have gained manipulative dexterity by long experience in teaching practical anatomy. The acceptance of Listerian principles has changed this plan. Now surgeons avoid dissecting-rooms.

I was dresser to John Whitaker Hulke, at this time in his prime as a surgeon. He trained at King's College Hospital and was House-Surgeon to Sir William Fergusson. Great teachers dominate their pupils. Hulke was dresser to Sir William Bowman and this led him to take a deep interest in Ophthalmic Surgery; his association with Fergusson gave him a great inclination to General Surgery. Hulke was in the camp before Sebastopol in 1856; he had not amputated a limb until the magazine exploded in the fort. On returning from the Crimea, Hulke was appointed to the staff of Moorfield Ophthalmic Hospital; also to King's College Hospital, and migrated to the Middlesex Hospital in 1862 as Assistant-Surgeon, and was appointed Surgeon in 1870.

He was brilliant and versatile as an anatomist, surgeon, and botanist; and a palæontologist of European reputation. His austerity to students was such that they disliked to become his dressers, and persistently reminded

them in regard to note-taking that the memory is a treacherous tablet! He told me that he abhorred a fool. He need not have said this—it was so obvious. On the advice of the Dean I served under Hulke, enjoyed the work, admired the man, and derived great advantage. At the end of the dresser-ship, when congratulating me on becoming a demonstrator of anatomy, he said, the best surgeons were those who had worked hard in the dissecting-room; actual dissecting not only made men acquainted with Regional Anatomy, but it enabled them to appreciate tissue, and quickly recognize the structures exposed in the course of an operation. He also asked me if I could draw, and assured me that in teaching it was a great advantage to be able to sketch on a blackboard. I took the hint. After watching men who make chalk drawings on the pavement for alms, I soon became facile at this sort of work on a blackboard with coloured chalks. It has often amused me to remember that my foundations in Art were laid by pavement artists!

During the time I was associated with Hulke he was busy with the fossil remains of such extinct creatures as Iguanodons and Hypsilophodons. He was never happier than at meetings of the Geological Society, exposing the errors of Professor Owen in regard to antediluvian monsters, and in the midst of a busy surgical career, made substantial contributions to knowledge of the great extinct reptiles—the Dinosaurs.[1]

[1] I once saw Owen at the British Museum, Bloomsbury. After Owen's retirement Hulke occasionally visited his old antagonist at Sheen Lodge, Richmond. Owen wrote in a curious pedantic style with a bewildering terminology. Few read his books to-day. His discoveries among the remains of extinct mammals, flightless birds, and reptiles, and his descriptions of the anatomy of some rare living creatures will endure as long as Zoology exists as a Science.

As soon as I became a demonstrator, Hulke trusted me to dissect for him a specimen of the remarkable reptile *Sphenodon punctatus* from New Zealand, which he had been endeavouring to obtain for twenty years. This is a lizard-like creature possessing many affinities with the extinct Iguanodons, and Hulke was especially interested in its elaborate series of abdominal ribs. Living specimens are easily obtained now. Sphenodon is interesting as being the last living witness of bygone ages and has been described as 'a living fossil'. This reptile became more interesting to Zoologists when Baldwin Spencer discovered, in a little pit on the summit of its head, a median unpaired eye, with a stalk, which connects it with the pineal body. It is often called the pineal eye.

Whilst dissecting this lizard I got a clue to the nature of the round-ligament in the hip-joint of Man which has long been an anatomical puzzle. I derived the idea, from the relations of the round-ligament in Sphenodon, that it is the divorced tendon of the pectineus muscle. I wrote a short paper describing it in the *Journal of Anatomy and Physiology*, 1883, which brought me into friendly relations with the editor of the journal, Professor G. M. Humphry of Cambridge.

Hulke was pious, and I was never satisfied that he accepted Darwin's view of the Origin of Species, but he added useful palæontological evidence in support of it. Although grim, probably on account of being childless, now and then his face would light up with a grin, especially at one of his own jokes. When consulting with a medical colleague over a borderland case, in a facetious mood, Hulke would twit the physician by saying: 'Physicians need not be good surgeons, but every surgeon should be a good physician.' He made this joke so often that the physicians tolerated it, and discreetly smiled. His lectures, delivered in low tones, usually to a small

class, sent students to sleep. I remember on a warm afternoon while he was mumbling the clinical lecture, a student at the top of the theatre went to sleep and fell on the floor with a bump. Hulke looked up from his manuscript and said with animation, 'Gentlemen, the young man reminds me of Eutychus!'

On another occasion he delivered a lecture on Supernumerary Fingers and Toes, apropos of a patient in his ward. In order to emphasize the fact that such malformations 'run in families' he ventured on the following story:

A lawyer visited Palestine with a charming young woman. About ten months afterwards he received a letter from her informing him that she had become the mother of a fine boy, of which he was the father. The lawyer sent for his doctor, and asked him to visit the mother and examine the child; especially the feet. In due course the doctor visited the mother, examined the baby-boy and reported it to be a fine healthy child—but it had six toes on each foot!

The lawyer was quite satisfied in regard to the parentage. He had six toes on each foot!

Hulke often spent week-ends in the Isle of Wight digging for fossils, and reconstructing them; but he in turn became fossilized!

In 1879 I followed him round the ward. At this date Lister was almost daily demonstrating his methods of Antiseptic Surgery at King's College Hospital, in the Strand. The opposition to the Gospel of Antiseptics was astounding—almost unbelievable. Hulke openly sneered at Antisepsis, but discreetly used carbolic lotion, and his dressers worked the spray. At that time sepsis and post-operative erysipelas flourished in the Hospital, but he obtained much better results than his colleagues, T. W. Nunn, George Lawson, and Henry Morris. The Senior Surgeon, Nunn, openly laughed

at Antisepsis; he said the chief difference between the New method and the Old amounted to this: in the Old method, surgeons washed their hands after an operation; in the New, they washed their hands before an operation! In the operating-theatre it was considered vulgar for the surgeon to take off his coat, he merely turned up his cuffs. In a room off the theatre there was a brasier with firing-irons in readiness for destroying exuberant growths, and for searing septic wounds which oozed freely. Gas was used for illuminating purposes; for close work, particularly at night, candles were used and hot wax trickled freely into the wound. The wooden operating-table was blood-stained and so dirty that it would have disgraced a tap-room!

In spite of his attitude to Listerism, and probably in consequence of the use of carbolic lotion, Hulke not only obtained good results with his operations but was keen on new procedures. He was the first surgeon in London to perform secondary suture of a divided nerve.

He was conscientious, especially in hospital duties. In 1895 he got up in the middle of the night to operate on a hospital patient for strangulated hernia. It was a bitterly cold night; he was chilled; pneumonia supervened, and he died 19 February 1895. Hulke was President of the Royal College of Surgeons and Hunterian Orator, but on 14 February, Hunter's birthday, he lay on his death-bed. The Oration he had prepared was delivered by Thomas Bryant, his immediate predecessor in the Presidential Chair.

INJURIES OF THE PERIPHERAL NERVES

While I was dresser to J. W. Hulke, a woman was admitted who had some months previously cut her wrist accidentally with a pane of glass. In the accident the

median and ulnar nerves had been completely divided, and there was complete loss of tactile sensibility in the hand. Stimulated by the knowledge that Jessop of Leeds had successfully performed secondary suture of the Great Sciatic nerve on a mower, who had accidentally cut his thigh with a scythe, Hulke operated on the woman, found the cut-ends of the nerves, removed the bulbs and reunited the nerve-ends with sutures. The operation was successful and this was the first instance of a successful secondary suture of a divided nerve in London. Surgeons had been afraid to suture cut-nerves in this way for fear of tetanus. The cause of this dread disease had not been discovered at that date, and no one had any idea that tetanus was due to a bacillus.

This simple method of dealing with divided nerves soon spread; as a consequence, surgeons learned that it was their duty in dealing with incised wounds of the limbs, to examine them carefully, and immediately rejoin with sutures cut-nerves as well as cut-tendons. I was impressed with the neatness, care, and skill with which Hulke performed the operation, and this induced me to devote some attention to injuries of nerves. In 1880 I spent some months in Paris following surgery in the chief hospitals and came across Létiévant's *Traité des Sections Nerveuses*, and his theory of supplementary sensibility. In the treatment of gunshot injuries it happens often that nerves are not only divided transversely, but large portions of them are destroyed; such destruction makes it impossible to bring the ends of the nerve together in order to fill the gap. Attempts have been made in such conditions to graft the ends of divided nerves into adjacent nerve-trunks. In order to test the effects of this method, I made (in 1882) some experiments on cats, such as dividing the median and ulnar nerves in the limb, and joining the proximal end of the

median to the distal end of the ulnar; and the proximal end of the ulnar to the distal end of the median. The nerves joined satisfactorily and the cats seemed none the worse. There is a dissection of the forelimb of a cat, the subject of my experiment, in the Museum.

I also made some experiments on the vagus nerve in order to satisfy myself that when this important nerve was accidentally divided in the neck, during an operation the patient suffers little obvious inconvenience.

These experiments were interrupted by the Weekly Board of the Hospital. The Secretary intimated that if I desired to be a member of the Surgical Staff such experiments must cease; if the Anti-vivisectionists heard of them they would make an outcry, and such disturbances might seriously check the flow of subscriptions!

In the Great War my experiments and observations on injuries of nerves were of great advantage to me in dealing with wounded soldiers. Unfortunately the remote results of surgical operations on gunshot injuries are not matters for boasting.

Occasionally the results of secondary nerve-suture are very good. At the battle of Omdurman (1898) the 21st Lancers gallantly charged a body of 2,000 dervishes. The Lancers lost one-fifth of their number in killed and wounded. In the charge, a dervish slashed at an officer and cut his left wrist badly, severing the ulnar artery, nerve, and adjacent tendons. The surgeon who treated the officer overlooked the injury to the nerve. When the officer recovered, the skin of the little finger, and the region supplied by the ulnar nerve, were insensitive and he amused his friends by applying the burning end of a cigarette to the numbed finger. The skin ulcerated in consequence. A year after the battle I united the divided end of the nerve. The ulcers quickly healed and sensation returned in a few months. As a result

of the injury the little finger became bent into the palm; this was troublesome to the officer when hunting because the reins often hitched under the bent finger, and at his request I amputated it. Twenty-five years later I saw the officer in good health. He had a healthy, useful hand.

PRACTICAL ANATOMY

To many men the dissection of the human body is distasteful. Some students begin to dissect with prejudice, overcome the dislike and become zealous anatomists. Some never overcome the distaste and abandon Medicine. Darwin was an example; he disliked dissecting and his ignorance of human anatomy hindered him in his observations, because he had to rely on others for information on matters connected with 'the bodily structure of Man', especially rudimentary structures which form a great class of facts in relation to 'the Origin of Man'.

The distribution of 'subjects' in the dissecting-room requires judgment. Every student must be signed up as having adequately dissected during the term. Many students waste the 'parts' by neglecting them, or dissecting them badly. In such circumstances I would give the 'part' to another student. Sometimes there was a fuss. I acted on this principle: when a student acquired a part he did not purchase it, but merely bought the privilege of dissecting it. On one occasion a loud complaint was lodged of my conduct to the School Committee concerning the way I distributed the subjects. The Committee asked me to explain: my reply was to the effect that I had followed the teaching set forth in the Parable of Talents, and it was my hope that instead of paying attention to the petty complaints of idle students, the members of the Committee should put their heads

together and find a way of increasing my emolument. No student ever complained afterwards and the Committee never again interfered with me.

My early training as a teacher helped me to interest a class of pupils as well as to keep them in order. Teaching Human Anatomy was more to my taste than training boys in reading, writing, and arithmetic, and once weekly the monotony was varied hearing them repeat the Creed and Ten Commandments in the vulgar tongue. Nevertheless it can be dry enough coaching idle and backward students in Human Osteology to enable them to pass their professional examinations. Sixty years ago these exams. were not the severe tests they are to-day. When I began to teach Anatomy at the Middlesex Hospital, students who required to cram went to a 'grinder' who lived near the School. His method consisted in sketching a bone, e.g. the femur, on a blackboard, then indicating the muscles attached to it, in chalk,—red and blue lines for arteries and veins respectively, and marking the nerves with yellow chalk. All of course in proper relationship. This 'grinder' boasted that by this system he would in three months enable a cabman to pass the anatomical examination of the Apothecaries Hall.

In the first half of the nineteenth century the dissecting-room was a rowdy place; a sort of common-room for idle students. A notion of what Mr. Pickwick called the 'Eccentricities of Genius' of Medical Students may be gathered from the *Pickwick Papers*, 1836, and by Albert Smith in *Punch*, 1841. Smith was a student of the Middlesex Hospital; William Brundle, the dissecting-room porter, remembered him and told me of his escapades. Brundle was crammed with lurid tales connected with the room. He was a faithful servant of the School and lived to a great age. In the last

decade of his life he married and became ardent in the cause of the Salvation Army.

In my first year (1878) the dissecting-room was regarded more or less as a Sports Ground. On two occasions I disturbed a boxing-match, and a rat-hunt was another form of diversion. Only on one occasion do I remember beer being 'drunk on the premises'. On becoming demonstrator and therefore responsible for the room, I prohibited smoking on the ground that it was disrespectful to the dead. An occasional cracker on Guy Fawkes' Day passed without comment.

To-day the dissecting-rooms are used for the earnest study of Human Anatomy. I taught Anatomy in the Middlesex Hospital Medical School for seventeen years, Demonstrator twelve years, Lecturer and Superintendent five years.

Facility in operating depends on an accurate knowledge of the anatomy of the human body acquired by dissection; and on practice as well as personal aptitude.

On one occasion the students wished to have a photograph of a mock operation, and the dissecting-room boy agreed to be the patient: A table and the paraphernalia requisite for an amputation through the thigh were set out; the boy acted as patient. After the photograph had been taken, I asked him why he had selected a blunt old-fashioned amputating-knife. Subsequently this boy explained that he had exchanged the sharp knife for a blunt one because he had an idea that in the course of the 'business' I should forget it was a sham-operation and cut the flaps in his thigh before anyone could stop me! This is a good example of the low cunning so often manifest in uneducated assistants. (*Plate II.*)

Even in a lesson on Anatomy there is scope for amusement. The method of teaching students in a limited class—a dozen is a convenient number—over a carefully

dissected region of the body is admirable; it enables a demonstrator to appreciate the ability of the students, and it is for them a good training for the oral examinations which they must pass in order to gain a Qualification. This method affords scope for wit and repartee on the part of the teacher and the taught. I remember giving a demonstration of this kind on the liver, and in the course of it I lifted up the gall-bladder with a pair of forceps and asked a witty Welshman (who for the purpose of the story I will call Fluellen) if every animal had a gall-bladder. He replied, No, in the horse the gall-bladder is absent. His reply startled me; I asked, Who told you that a horse lacks a gall-bladder? he answered, A cabby. (Loud laughter.) I then invited him to tell the class how he managed to get a lesson in anatomy from a cabman. This is the story:

On Lord Mayor's Day, Fluellen and four other students dined at the Horse Shoe; when they wished to go home they hired a cabman to take them to Camden Town on the condition that Fluellen drove. This was agreed. On the journey they passed the Royal Veterinary College and this led the cabman, who knew he was dealing with a medical student, to remark 'Sir, do you know a 'orse 'aint got a gall-bladder?' Fluellen at once remarked, 'How do you know a horse hasn't got a gall-bladder?' The cabman informed him that he had a favourite old horse which he took to the Veterinary College; it died. A post-mortem examination was made which the cabman attended; when the liver was examined, the cabby looked at it and asked, 'Where's the gall-bladder?' The veterinary surgeon explained to him that in the horse the gall-bladder is absent.

It was from occasional fun of this sort, which I permitted—and enjoyed—that my anatomical demonstrations got the name of Bland-Sutton's entertainments.

A DEMONSTRATION IN ANATOMY IN THE OLD DISSECTING-ROOM OF THE MIDDLESEX HOSPITAL, 1882

THE DIAGRAMS ON THE SLATE REPRESENT THE FEMUR, AND THE TRACK OF THE FALLOPIAN AQUEDUCT

A. Elam *A. W. Ogle* *The Author* *L. P. Gibson* *C. J. O. Brown*
W. B. Cockell *J. W. Ware* *W. K. Sibley*

Anatomical-rooms are now places of earnest study. Students spend money freely and are often impecunious, and in this condition they try to borrow money from complacent friends and teachers. When a student was especially bold in making requests for loans, instead of rudely refusing them I sometimes sent this reply by post:

I own some silver tokens,
But very few bits of gold;
And I strive to save some cash
For the days when I am old;
You may think me very soft,
But if I give you money
I deserve to nibble wax,
You laugh and eat the honey.

This did not relieve his necessity, but it caused his importunity to cease.

THE ETHICS OF THE LECTURE-THEATRE

The Lecturers in a Medical School vary much in temperament, methods of teaching, and manner of dealing with students. On the other hand, students are stern critics, and the management of a class of young men requires judgment and toleration on the part of the teacher.

Many years ago I was asked to lecture on Pathology at the Royal College of Veterinary Surgeons, London, and the Principal warned me that the students were apt to be unruly. My predecessor had resigned the post because on one occasion he admonished them for slight misbehaviour, and in a style which they resented by immediately rising *en masse* and endeavouring to put him out of the window! The Principal, hearing the noise, rushed into the lecture-theatre and restored order.

At my first lecture one of the students came in late and deliberately pulled a pink racing paper out of his pocket and began to read it. I asked him to go out and satisfy his mind about the 'favourite'. He promptly put the paper aside. I never had any difficulty with that class.

Medical students are caustic critics, they are not slow to resent rudeness on the part of the teacher and they appreciate wit from him. T. W. Nunn was an able surgeon, an amusing lecturer, and occasionally allowed the class a little licence; consequently was popular with students. While delivering a clinical lecture on diseases of the spine, he turned his back to the audience in order to sketch a vertebra with chalk on the blackboard. I saw a student from the top of the theatre throw a ripe gooseberry which hit the chalk and knocked it out of Nunn's fingers. He turned to the class, laughing and said, 'Well thrown, you couldn't do it again if you tried a hundred times'. The class laughed in response—then Nunn added—'Don't try'. (Applause.)

Materia Medica is a distasteful subject to many medical students; in my second summer session I attended a course of lectures devoted to this subject. The lecturer, a prosy old physician, had a shiny bald head, and delivered his lectures in an unctuous manner as if he were preaching. One lovely afternoon the students were more interested in the Sports Grounds than in drugs, and the lecturer, more prosy than usual, dealing with the art of writing prescriptions, turned to write an example on the blackboard; instantly from various parts of the theatre ripe cherries were thrown at the old fellow; two struck his bald head. Seized with indignation, he walked out of the theatre and sought the aid of the Dean. The next day he wisely resigned his lectureship.

Fifty years ago the Lecturers on Chemistry were as

unpopular as those on Materia Medica; the lecture was invariably known as 'Stinks'. At the Middlesex Hospital in my time the Lecturer on Chemistry was a conceited, bumptious man; he could not manage his class and was in consequence extremely unpopular. On one occasion his theatre was the scene of wild disorder. A facetious student named Williams resembled 'Samuel Pickwick, Esq.' and was called 'Pickwick' Williams. The lecturer was specially sarcastic to him. One afternoon the lecturer arranged a demonstration to prove that when two volumes of hydrogen are mixed with one volume of oxygen in the eudiometer, and exploded by means of an electric spark, the gases combine and form water. The apparatus was in order on the desk in front of the class. The lecturer explained what would happen, and looking towards Pickwick Williams, noticed him sneer; he then asked him sarcastically what he thought of it. Williams replied: 'I very much doubt it.' The contact was made. No result! No water! The experiment completely failed. Then followed a scene; the apparatus was broken and the lecturer hustled for rudeness to Pickwick Williams; I never saw such pandemonium, and the lecture ended in wild disorder.

In order to appreciate the following story, it is necessary to bear in mind that a student, in order to be 'signed up' for a qualifying examination, must attend recognized courses of lectures, and the attendance sheet is under the control of the Lecturer. When delivering a lecture at the opening of a Winter Course on Surgery I noticed a new student reading what appeared to be a novel. I tried to attract his attention by directing my voice towards him, but without avail. Turning to the class I said, following the usual style of the lecture-room: 'There is a gentleman on the top bench who is not interested in the lecture.' No response; the student did

not raise his eyes from the book! Then I remarked, 'If the gentleman is merely attending to be signed up, I will tell the janitor to sign him up without attendance'. No response. I remarked, 'he adds rudeness to inattention'. No response—a senior student sitting near stood up and explained that the inattentive student was deaf and had not heard a word! He was a dental student and was merely attending the surgical lectures to fulfil the regulations.

To my mind regulation-lectures are too many and too long. It fell to my lot to be on a Committee for the selection of a Professor of Surgery for the University of Cape Town. Mr. C. F. M. Saint was selected by the Committee. It happened that near the time of the opening of the Session of the University I was on my way to Cape Town; a few days before reaching the Cape, I received a 'wireless' inviting me to initiate the Chair of Surgery.

Professor Saint delivered his Inaugural Address and I was invited to speak, and took the opportunity of suggesting to the Professor that he would be wise, save in exceptional circumstances, to limit his lectures to thirty or forty minutes, and never to exceed an hour, for this reason: As the seats were hard, and the subject of the lecture dry, there was a fear that the irritation provoked under the strain of long lectures, some of the students might develop ischial callosities like baboons. (Applause.)

FREEMAN OF BATH

One morning, in October 1881, I saw a well-dressed man of middle-age, wearing a top-hat with an unusually broad brim, critically examining the 'subjects' in the dissecting-room. He introduced himself as 'Freeman of Bath'. Henry William Freeman was born at Westward

Ho and entered the Middlesex Hospital Medical School in 1861. He obtained the membership of the Royal College of Surgeons of England in 1864, and became House-Surgeon at the Royal Bath United Hospital the following year. At the end of his term of office he went into practice with the leading surgeon in Bath, and lived at 24 Circus, the house where Gainsborough painted famous pictures. Freeman had two ambitions—to become Surgeon to the Hospital at Bath and to breed a Derby Winner!

No vacancy occurred on the hospital staff until 1881 and there was a law that surgeons to the Hospital must be Fellows of the Royal Colleges. Freeman was elected on condition that he fulfilled the condition within a year. He was determined to retain the post, and though he had been away from hospital work many years, set to work to obtain the necessary qualifications, and arranged with me to coach him for the English Fellowship. I soon realized it was hopeless for a man busily occupied in a lucrative practice to fit himself for such a severe ordeal, but he succeeded with the Dublin College, retained his post, and we became lifelong friends.

Freeman was deeply interested in improving the Thermal Baths of Bath. He was on the Town Council and became Mayor of Bath in 1889. In order to fulfil his ideal we visited over a period of five years Aix-les-Bains, Vichy, Royat, Homburg, Carlsbad, Franzenbad, Marienbad, Gastein, Ischl, and Kissingen among others. These visits and observations helped in no small measure to bring Bath into line with the most useful and fashionable spas in Europe.

These continental visits had a double object; in addition to professional work Freeman was deeply interested in breeding racehorses, and kept an extensive thoroughbred stud at Weston, near Bath. He had an intimate

knowledge of the pedigree of Derby Winners and his visits to the farm gave him great pleasure. He did not train racehorses, but sold his yearlings. Above all his other ambitions his one desire, as I have already mentioned, was to breed a Derby Winner. When we were on the Continent, after making observations at the spas, we visited stud-farms and in this way often found ourselves in curious places and among famous horses, especially at Kisber in Hungary. On one of our visits we heard that a pedigree stallion, of which Freeman entertained a superlative opinion, was to be sold at an auction in Paris. He was seized with a curious, indeed an irresistible impulse to acquire this horse. We went to Paris and he asked me to bid for the horse up to one thousand pounds. When I saw the stallion I did my best to dissuade him from buying. I said the horse, in spite of its pedigree, was not worth more than £25. The animal was obtained for £500, and in due course safely installed on Freeman's stud-farm, where it lived for many years. It never begot a useful foal and after my friend's death was sold and 'the horse from Paris', as I always called it, realized £25.

In spite of maintaining the farm, and running a successful practice, Freeman's Will was ultimately proved at ninety thousand pounds. One of his last acts was connected with the Middlesex Hospital Medical School. He bequeathed one thousand pounds to found a scholarship to be awarded annually to a student for proficiency in Obstetric Medicine. The School Council accepted the Trust, and it is known as the Freeman Scholarship. The first award was in 1899.

Henry William Freeman died in 1897 aged 56 and was buried in Lansdown Cemetery, Bath. His grave is indicated by a stone cross and the most conspicuous letters on it are—F.R.C.S.

I began Clinical Medicine as out-patient clerk to Douglas Powell; we soon became friends and the friendship continued to the end of his life. He was an example of the old-fashioned physician—courtly and grave. At one of the visits a wheezy, talkative old woman was upbraided for not attending regularly. She excused herself in the fashion: 'Well, Mr. Powell, I 'ain't come for 'ospital medcin, it 'ain't done me no good, so I just bought a bottle of Powell's Balsam of Aniseed, and called to tell yer that the first bottle cured me!'

This tickled Powell, and it amused me because in my childhood when I had a cough my mother regularly dosed me with this familiar patent medicine.

Douglas Powell was sympathetic to patients. I remember going with him to operate on a woman; on our way through Camden Town we passed through the street where he attended his first midwifery case—a young woman in labour with her first baby. He pointed out the house, and remarked that the agony of the woman in labour and the contrast of her state of mind the following morning when he found her free from pain, comfortable, and happy with her child, left an indelible impression on his mind. My first experience in Midwifery affected me in the same way. The contrast between the tribulation of a woman in labour and her happiness a few hours later—when she hugs the child to her bosom—is nowhere better expressed than in the familiar verse: 'A woman when she is in travail hath sorrow because her hour is come; but as soon as she is delivered of the child she remembereth no more the anguish, for joy that a man is born into the world.'

Powell's nephew, Theodore D. A. Cockerell, entered the Middlesex Hospital as a student in 1883, and at the time I was helping Powell with a book on Pulmonary Consumption. Cockerell was a remarkable young fellow

and at the age of 14 had an accurate knowledge of the snails of England, and notwithstanding his youth, his opinion was frequently sought by amateur collectors in regard to the specific identity of shells. Powell asked me to keep an eye on Theo, and as he had recently lost his father, it was necessary for him to qualify as soon as possible. We soon became excellent friends. An intimate knowledge of shells, though delightful in itself, is not required for the anatomical examinations of the Examining Boards. My young friend also disturbed the equanimity of examiners by disagreeing with them on facts in Human Anatomy. These discrepancies involved his rejection, and the abandonment of Medicine as a career.

Through the influence of Sir William Flower, at that time Director of the Natural Museum, Cockerell was appointed Curator of the Museum at Kingston, Jamaica. Later he became Professor of Natural History in the University of Colorado. He continued to correspond with me; and in 1891 I received from him an excellent article he had written *On the Distribution of Slugs*. His field notes, articles, and essays are as clever, original and stimulating as in the days when he wandered among the fields, lanes, ponds and ditches in the South of England. I have received from him descriptions of observations made in the Rocky Mountains, Japan, Siberia, India, Madeira, and the last came from Tashkent in Russian Turkestan, where he was allowed to bring away 'collections of bees and snails to be studied' (1929).

Professor Cockerell inspires his pupils with what seems to be the main object of his life—intense love for Natural History.

In the early part of this chapter I expressed deep regret that I never served as House-Surgeon. I never sought the post because this involved residence in the

Hospital and the resignation of my post as Demonstrator of Anatomy. As I grew older I realized the experience I had lost.

During the period of dressership it was customary at Middlesex Hospital for the senior dresser during the 'take-in week' of his surgeon to dine with the Resident Staff. I enjoyed this privilege on several occasions and appreciated its advantages. Emergency cases are admitted at all hours and the experience gained by watching the methods of dealing with such patients is invaluable. In addition to mingling with the resident staff when off duty and taking coffee with them in the common-room, discussing the events of the day is instructive; criticizing the actions and decisions of the surgeons is illuminating and often amusing. House-Physicians and House-Surgeons are occasionally very frank in expressing their opinions, and make a confident diagnose concerning the illness of a patient which puzzles their seniors.

THE BOARD ROOM

In 1879 the Board Room of the Hospital was used for many purposes. Primarily it served for the meetings of the Weekly Board. It was a Committee Room for the Medical School, and an office for the Dean; there were racks for the hats, coats, sticks, and umbrellas of the Honorary Staff; and in this room physicians and surgeons met to gossip.

It was the dining-room for the Residents, the Lady Superintendent, the Chaplain, House-Physicians, House-Surgeons, the Clinical Clerk and the Dresser of the week, and the Interne on midwifery duty. Every day except Sunday the Secretary met the convalescent patients in this room for discharge, and accepted any pecuniary offering they wished to make in return for benefits received—and listen to complaints—if any.

On Sunday morning the Board Room was used for Divine Service. To-day this room is reserved exclusively for the Governing Body. Through the exertions of Mr. George Lawson a beautiful Chapel was built on the site of the old post-mortem room. It is a memorial to Major Ross, for many years Chairman of the Weekly Board. Following Mr. George Lawson's initiative, members of the Honorary Staff have helped to beautify its interior, and the Chapel may be described as an ecclesiastical gem.

In 1909 Mr. W. Sampson Handley, at that time my Assistant-Surgeon, arranged for his son Richard to be baptized in the Chapel, and wished me to be godfather, and in this capacity I attended the ceremony. As the Chapel lacked a font, the Chaplain, to meet this deficiency, used an old marble stoup brought from Italy. I remonstrated with him for using such a dirty vessel. He replied, 'Oh, it is very old!' I maintained it was a disgrace to the Chapel. The matter ended in this way: I agreed to present a font and it was to be designed by the architect—John Loughborough Pearson. In addition, the font was to carry on its rim the famous Greek palindrome, cut in conspicuous letters:

ΝΙΨΟΝΑΝΟΜΗΜΑΜΗΜΟΝΑΝΟΨΙΝ

this being a favourite version in England.

The Chapel Committee accepted my offer. A year later the font was set up. It is carved out of a single block of verd-antique; at the corners are emblems representing the four evangelists; on the broad rim of the basin the palindrome is cut in relief and in large letters easily seen by visitors.

About two years after the font had been placed in position Queen Mary visited the Hospital. She was conducted to the Chapel to look at an ambry and piscina

which had been placed in the chancel to the memory of her brother H.S.H. Prince Francis of Teck, Chairman of the Hospital. He died in 1910. The Queen was also shown the font and asked me the meaning of the palindrome. I gave her the accepted English translation:

Wash my transgressions not only my face.

The Queen looked at me inquisitively, then turned and walked out of the Chapel. To this day I have never been able to satisfy myself whether she was puzzled—or amused.

I have realized that presenting a font and an ambry to a memorial chapel is an expensive artistic hobby.

Among my fellow-students at the Middlesex Hospital was one with whom I made a close friendship which lasted throughout life—Walter Essex Wynter. We joined the School within six months of each other and attended the same lectures and classes. In those days there was no special teaching for the Fellowship of the Royal College of Surgeons of England; we were left to our own devices and succeeded in obtaining this diploma.

Wynter was associated with me as Demonstrator of Anatomy for five years. During this period I was closely investigating the *Nature of Ligaments*, and he made neat water-colour drawings for illustrating my articles in the *Journal of Anatomy and Physiology*. In those days Wynter intended to practise as a surgeon; he took the Fellowship Diploma for this purpose. In 1884 he was House-Physician to Dr. William Cayley and then became M.D. London. In 1891 a vacancy occurred on the staff and he was appointed Assistant-Physician to the Hospital.

Some years later Wynter explained to me that he turned to Medicine in preference to Surgery because he

was appalled at the heavy mortality which attended surgical operations. This was in the early days of Antisepsis, and during the reign of the Spray.

As years rolled on, each became Chief of his respective department in the Hospital—Wynter in Medicine; I in Surgery, and as correlatives, for it was my duty to carry out surgical measures required in Dr. Wynter's wards: our work proceeded not only smoothly, but happily; my medical colleague had a genius for Surgery and performed some of the minor operations required by his patients. Our association in the work of the wards was delightful and he repeatedly urged me to undertake novel surgical problems. In quiet converse with Wynter I asked him if he regretted abandoning Surgery. His reply was whimsical: 'Like the girl in the Play, I took the wrong turning!' Then he added: 'A good motto for physicians would be, "The labour we delight in physics pain".'

As soon as I obtained a qualification, I acquired the lease of 22 Gordon Street, and took resident pupils. I also arranged a small class-room in which to coach students for their examinations, especially for the Primary Fellowship of the Royal College of Surgeons of England. The biggest room in the house I used as a museum.

A medical practitioner, with the same surname and initials, J. B. Sutton, opened a shilling dispensary in the Euston Road, near my house, and it was soon spread abroad that the dispensary was my venture. I took no notice until women brought their babies to be vaccinated, and occasionally rang me up in the night for cheap midwifery. To avoid such incidents I altered my door-plate to J. Bland-Sutton, and in 1899 assumed the name of Bland-Sutton by Deed Poll.

CHAPTER IV

THE MUSEUM

EVERY important Medical School has a Pathological Museum; it is indispensable for teaching purposes and a study of the Museum Catalogue will usually reveal, not merely the history of the hospital and the school, but the part its physicians and surgeons have played in promoting the Science and Art of Medicine. In this way a good Pathological Museum may be a valuable record.

The Museum of the Middlesex Hospital when I joined the school (1878) was very attractive. It was housed in a commodious and well-lighted building and contained a small, but choice, collection of specimens illustrating the Osteology of Vertebrate Animals. Those representing mammals were excellent and began with Platypus and ended with Man. The rarest specimen was the skeleton of a native black of New Zealand. No one knew its history. In 1924 I induced the Museum Committee to exchange it with the Royal College of Surgeons for some useful teaching material, as an isolated specimen of this sort, though a novelty, at the Middlesex Hospital, would be appreciated in Lincoln's Inn Fields.

At the College this skeleton was carefully cleaned and the following inscription was found written in ink on the skull: Koretta Canbilly, a native of New South Wales, 35, killed in a fight by a spear thro' his back. November 2nd 1832 at Fort Macquarie.

The excellent skeletons in the Museum were prepared by Sir William Flower, who filled the post of Curator for ten years. During this period he had been elected Assistant-Surgeon to the Hospital and served in the Crimean War: on returning to London he abandoned Surgery for Comparative Anatomy, became Conservator of the Hunterian Museum (1861–84), and devoted his attention to the Anatomy of Mammals and Anthropology —especially the brain and skull of Man. In 1884 Flower resigned his post at the Royal College of Surgeons and became Director of the Natural History Museum in succession to Sir Richard Owen.

Flower left his mark on each Museum in which he worked—Middlesex, Hunterian, and South Kensington. His interest in Mammalian Osteology was intense and persistent; individual bones were mounted in series to show their modifications from a shrew-mouse to an Asiatic elephant. In each museum the skeletons of whales were suspended from the ceiling; small whales in the Middlesex Hospital; large sperm-whales in the Royal College of Surgeons, and huge rorquals in the Natural History Museum, South Kensington. When Flower resigned the Curatorship of the Middlesex Hospital Museum he was succeeded by Spencer Cobbold, distinguished for his knowledge of intestinal parasites. Cobbold collected a small but excellent series of Entozoa, for many years a special feature of the Museum. In his time there was a charming but eccentric physician on the staff, Dr. William Thompson, who was afraid of Entozoa. Whenever he suspected that Cobbold had been examining worms he would not use the towels and soap provided in the lecturer's room, but strolled across the garden to the room of the Resident Medical Officer. Thompson disliked Cobbold, and feared Entozoa!

Mr. C. H. Moore was Surgeon to the Hospital and

in 1847 prepared a manuscript catalogue of the contents of the Museum. He was successful in dealing with malignant tumours, and the late stages of Rodent Ulcer with the actual cautery. For many years the Hospital enjoyed a reputation for the treatment of advanced cases of this disease. A cupboard in the Museum contained skulls and sequestra showing the results of this heroic method of treatment, in which Moore and his assistant-surgeon, George Lawson, excelled. The first operation I saw in the theatre was performed by Lawson: A man had an extensive rodent ulcer involving his eye, orbit, and eyelids. He neatly excised the skin edges of the ulcer and then seared the floor of the ulcer with red-hot irons. I was horrified that a man could do such things to a fellow-man! The whole affair made me think of a farrier adjusting a hot shoe to a horse's foot. Some years later I reminded him of this ; he laughed and said, 'You soon get over it!'

Lawson described Moore in regard to surgical operations, 'as a combination of extreme caution and extreme rashness'. The museum contains some remarkable examples of Moore's skill which justify this epigram.

The Museum contained the usual collection of malformed mammals, such as two-headed calves, dogs, cats, pigs, and human fœtuses—things commonly called freaks. One of the most attractive specimens is a glass case containing the skeletons of two dogs—one big and the other little—arranged in the position of Dignity and Impudence, in Landseer's well-known picture. There was a tale current in the school that these were the skeletons of the dogs which actually 'sat' for Landseer's picture. I have not been able to substantiate the claim. The picture was painted in 1839.

Among the curiosities there is an atlas and axis showing a transverse fracture at the base of the odontoid pro-

cess, produced by a pistol bullet which lies flattened behind it. A man—Latham by name—was lying in bed with a woman, both of them asleep. An Italian valet, Burinelli, entered the room, placed the muzzle of a pistol behind Latham's neck and shot him. Latham never moved. This was known as the Foley Street Murder, 1855.

The Medical School of the Middlesex Hospital was founded by Sir Charles Bell in 1835. He joined the famous Windmill Street School in 1811. My desultory reading as a boy included Paley's *Natural Philosophy*, with illustrations from Natural History by Sir Charles Bell. Also Bell's *Bridgewater Treatise on The Hand*, its mechanism and vital endowments as evincing design. I studied these books closely, but Bell's teleological explanations failed to convince me. I was particularly amused by the explanation of the curved upper tusks of the wild boar (*Babirusa*) of the Celebes. At that date naturalists seriously suggested that this pig suspended its head by means of its curved tusks to branches of trees while it slept!

When I became Assistant-Curator of the Museum in 1883, I was delighted to find, in the Physiological Series, many excellent specimens, some of which were used by Bell to illustrate his book on the Hand. If Bell did not dissect the specimens I feel sure they were prepared for him by John Shaw, who assisted him in Anatomy at the Windmill Street School. They are exquisitely dissected and mounted, and though prepared one hundred years ago are, at this date 1930, in excellent condition and serve as models of museum specimens.

This series also contains a masterpiece of dissection: a section of the spinal cord and its membranes showing the four lower cervical and first dorsal nerves, which enter into the formation of the axillary (brachial) plexus,

on each side. Each plexus has the big inferior cervical ganglion of the sympathetic nerve, with its various branches to the spinal nerves, neatly dissected. This specimen is historical, for it is drawn of natural size in Plate 3 of Bell's *Nervous System of the Human Body.* It is clean and as well preserved as when first mounted. The anatomists of that period have never been surpassed. The School of Anatomy in Great Windmill Street, founded in the days of William and John Hunter, was not merely famous as a teaching institution, but it served as a place for research. William Hunter had acquired a knowledge of the art of injecting blood-vessels, with coloured wax, while on a visit to Ruysch and Swammerdam in Holland.

When Hunter and his assistants, including his famous brother John, investigated the lacteals and lymphatics by means of the injection of quicksilver, they produced and preserved beautiful specimens for museum study, and teaching purposes. A few of them are yet preserved in the Middlesex Hospital Museum; some are works of art. When Charles Bell left Windmill Street School and founded the Middlesex Hospital School he probably brought some of these specimens with him. In the history of the School it is stated that when the Museum was established in 1840 it consisted chiefly of preparations belonging to Shaw, Tuson, and Sweatman. Some of John Shaw's specimens illustrating abnormal curvatures of the spine are excellent examples of the skill of the articulator and extremely useful for teaching purposes. These are carefully protected in a glass case.

The Museum of the Royal College of Surgeons contains specimens mounted by Hunter which show the care with which specimens were chosen for preservation, and the extreme skill with which they were mounted. So successful was the Hunterian method of preservation

that a tumour of the tongue which had been preserved by Hunter 150 years ago, was cut down and examined histologically. The structure was as obvious under the microscope as if it had been preserved only a few weeks!

My personal interest in the Middlesex Hospital Museum began in 1883. I was appointed Assistant-Curator for the purpose of helping Dr. J. K. Fowler (at that date Assistant-Physician, Pathologist, and Curator of the Museum) to prepare a descriptive catalogue. In the course of the work I became interested in an instructive set of specimens illustrating diseases of the liver and gall-bladder which had been collected by Dr. Charles Murchison from the post-mortem room. Murchison was on the staff of the Hospital ten years (1860–71) and published an excellent monograph on *Diseases of the Liver and Gall-bladder*, which was recognized as the chief English work on this subject for many years. His descriptions and illustrative case-reports were based on these specimens. Murchison left the Middlesex Hospital for St. Thomas's Hospital; he acquired a great reputation and died suddenly in his consulting-room 1879. The Royal College of Physicians founded a Scholarship to his memory. I won this scholarship in 1884 and a week later passed the Final Examination for the F.R.C.S. Eng. My success in winning the scholarship was largely due to the knowledge of the clinical features connected with gall-stones I derived from the perusal of Murchison's book, and an intimate knowledge of his specimens. I did not allow this interest to wane. In 1891 I successfully excised some gall-stones from the common-bile duct of a woman, aged 58. I followed up Gall-stone Surgery keenly, and in 1907 opened a discussion at a meeting of the British Medical Association, at Exeter, urging the great advantage of removing the

gall-bladder when it becomes a mere repository for gall-stones. This work formed the basis of my monograph on *Gall-stones and Diseases of the Bile-ducts*, 1907 (see p. 199).

I carefully preserved the gall-bladders, and some of the unusual gall-stones which I removed, in the Museum, partly to be used in teaching, and partly to serve as mile-stones in the history of Gall-stone Surgery.

In my early years at the Hospital the Senior Physician was a pompous old fellow, Edward Headlam Greenhow. He was interested in Addison's Disease and had collected a number of suprarenal capsules illustrating the pathology of this curious disease. These specimens are carefully preserved in the Museum and form an instructive series. Greenhow embodied the result of his clinical and pathological observations in the Croonian Lectures he delivered at the Royal College of Physicians 1875. While rearranging the Museum in 1922 I took care to preserve these specimens intact.

Greenhow joined the staff of the Middlesex Hospital in 1861. In his youth he assisted his father who practised in North Shields, and this afforded him an opportunity of acquiring experience in what are now known as Occupational Diseases, and especially the changes in the lungs known as Miner's Phthisis. The Museum contains an excellent series of specimens, which I consider unique, showing the changes produced in the lungs by inhalation of dust accompanying such occupations as coal-mining, knife-grinding, glass-polishing, silvering mirrors, file-making, stone-cutting, and the like. These specimens were collected by Greenhow to illustrate his lectures; if lost they could not be replaced because such conditions are now rare. Mines, mills, and factories, where dusty conditions exist such as would cause these pernicious changes in the lungs, are supervised by

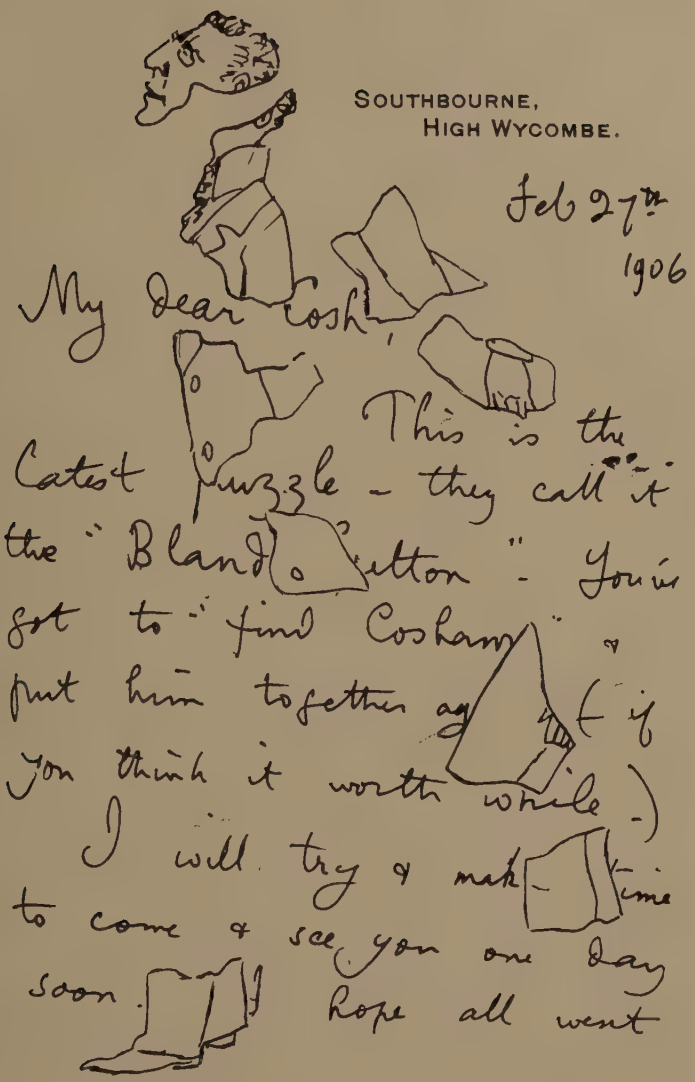
Government Officials whose duty it is to protect the health of workmen and workwomen.

Greenhow had a curious method of treating facial erysipelas; and in his day patients suffering from this affection were treated in the medical wards. Greenhow had the patient's face painted with nitrate of silver dissolved in collodion. In a few hours the face of the patient resembled a fogged photographic plate. When he made his regular ward visit he took delight in puzzling students as to the nature of this curious pigmentation! He enjoyed the joke.

Greenhow died in a curious way; after retiring from practice he lived at Reigate and often visited London. In Charing Cross Railway Station he was attacked with syncope. Porters assisted him to a waiting-room, where he soon died (1888). His only monument consists of the specimens illustrating Addison's Disease and Miner's Phthisis in the Museum of the Middlesex Hospital.

The Museum also contains a series of specimens illustrating stones in the kidney. In 1880 I saw Henry Morris remove a stone from a girl's kidney with success; this operation has become historical because it proved that a stone can be removed from a kidney and the patient survive. Such operations are now common in every general hospital in the world. The Middlesex Hospital Museum is rich in specimens obtained in this way.

I was closely associated with Morris in the early years of what is called Kidney Surgery and energetically pursued it for many years. On one occasion I removed the kidney with success from a gardener—it contained forty-thousand calculi. (They are preserved in the Museum of the Royal College of Surgeons.) There is in the Museum a huge branched stone which I removed



FIRST SHEET OF A LETTER WRITTEN TO COSHAM, WHEN IN A NURSING HOME, BY HIS FRIEND CHARLES R. B.

from an actor. I found him 'a fellow of infinite jest and most excellent fancy'. A few days after his operation he received a letter from a witty friend which is reproduced in *Plate III*, because it contains an excellent although lugubrious likeness of the patient, and gives an idea of the weird and comic fancies lay persons have of surgical operations.

In the early days of the Museum the pathological specimens, spoils from the dead-house, were evidence of the incompetence of Medicine to help or save patients. To-day, the specimens added to the Museum by surgeons are, in the main, prizes from the operating-room, and demonstrate the life-saving powers of Modern Surgery.

As the years rolled on, Pathological Histology assumed new phases and increased importance. I foresaw the need of a more intimate association between the care of living patients and the study of disease. I suggested to the Earl of Athlone, Chairman of the Middlesex Hospital, the desirability of pulling down the Old Museum, removing the Comparative Anatomy specimens into the Biological Department; attaching the Human Anatomy specimens to the Anatomical Department; and replacing the Old Museum by a Pathological Institute. I explained to Lord Athlone the advance in Medicine and Surgery required that the processes of disease should be investigated on material derived directly from the wards, to the greater advantage of the patients, and I would make myself responsible for the cost of the building.

The plan was accepted by the Weekly Board and the Institute was built in 1914. To-day it is like a honeycomb; rooms are arranged for Pathologists, Bacteriologists, Biochemists, Histologists, and independent research workers with original ideas, and all amply supplied with means for carrying them out. The Pathological

Museum—the central cell of this hive—is arranged on a modern plan, and supplied with a carefully printed catalogue.

Fifty years ago the path to Surgery lay through the dissecting-room. To-day it lies through the Pathological Institute.

In my early days at the Middlesex Hospital I felt the lack of a laboratory, and in later years realized strongly that the independent worker must not be forgotten. In the Pathological Institute rooms are set apart and facilities given to anyone showing cause for his ideas and methods. He is allowed to work on his own lines. The cause of Cancer may be discovered by an independent quester unfettered by routine and prompted by originality. He should be adequately rewarded and allowed to pursue his quest unhampered by domestic needs. The British Empire Cancer Campaign adopted, at the suggestion of Viscountess Cave, this motto: *Quod refert quis opus faciat modo denique fiat?* What does it matter who does the work so long as the work is done?

CHAPTER V

SURGERY

Apart from the technique of modern surgery it is the human element which makes it an attractive study.

HAVING entered the Middlesex Hospital firmly determined to practise surgery, from that decision I never wavered. In regard to the particular department of surgery in which a man practises, it is not always what he desires, it is what chance offers, and what he is prepared to grasp. As soon as I joined the Hospital, I at once attended the Casualty Room, and learned to open whitlows, and abscesses; and obtained experience in the treatment of simple fractures of the limbs, the reduction of dislocations, and the hundred-and-one conditions classed as minor surgery. The Casualty Surgeon appreciated such help and gave me many opportunities.

The Ophthalmic Department attracted students in 1878; Mr. George Critchett was in charge, and his unusual skill in removing cataracts made a great impression on me. I attended this department for one year and became dominated with the notion of practising Ophthalmic Surgery.

George Critchett was ambidextrous, and so skilful in extracting cataracts, that some American surgeons invited him to visit the States. One of Critchett's admirers further tempted him with the assurance that

if he visited America he would be shown the biggest cataract in the world and one he could not remove!

In 1880 I spent a Summer Session in Paris attending specially the Eye Clinics; also Medicine and Surgery at the Hôtel Dieu, and the Skin Clinics at St. Louis.

1881 was an eventful year for me; dominated by the idea of practising Ophthalmic Surgery I decided to spend a session in Vienna. Here I attended the Klinik of Professor Arlt; at that time Fuchs was chief assistant; I took out a private course in order to acquire some ability with the ophthalmoscope. Even at that date I foresaw that the ophthalmoscope would render valuable diagnostic aid in diseases arising elsewhere than in the eye.

Vienna at that time was a Mecca for surgeons, and Theodor Billroth was in his prime. I attended the Operating-theatre and read with interest his book on General Pathology and Therapeutics; this book, in its scope and style, resembled Paget's *Surgical Pathology*; the latter was to me, in those days, a surgical bible.

European surgeons in 1881 were startled by Billroth's enterprise in removing a cancerous pylorus, and the patient survived the operation three months. This marked the beginning of surgical efforts to relieve patients suffering from cancer of the stomach. On one occasion the theatre was crowded to watch Billroth stretch both great sciatic nerves of a man suffering from 'lightning pains' associated with locomotor ataxy. His coolness and dexterity were remarkable.

While I was in Vienna, changes occurred in the Staff at the Middlesex Hospital which ultimately proved of great importance for me. Hulke was elected to the Council of the Royal College of Surgeons; Morris became Lecturer on Surgery at the Hospital; and Arthur Hensman Lecturer on Anatomy.

One bright morning in July 1881, I came out of Billroth's Klinik in the Allgemeines Krankenhaus and sat on a stone seat in the shade of some trees, in order to read a letter from my friend Hensman, informing me of the changes in the Staff. He offered me the post of Senior Demonstrator of Anatomy. Whilst I perused the letter, two Englishmen, whose acquaintance I had made in Vienna, came to me and one said, 'Your letter must be of some importance to require so much attention.' I handed him the letter. After reading it he said, 'This offers you better opportunities than Ophthalmic Surgery. Accept it'. I wrote to my friend and accepted the offer. The spare money I had with me enabled me to buy some carefully prepared skulls, temporal bones, and other loose bones easily obtainable in Vienna, and return to London prepared to teach Anatomy and take up General Surgery. The friend in the Hospital garden who gave me this advice became successful in Otology and Laryngology at the Royal Infirmary, Manchester—Sir William Milligan.

On returning to London I soon became absorbed in the dissecting-room and regular visits to the Prosectorium at the Zoo. Teaching Anatomy occupied my time in the Winter Session; in the summer I was free to follow Surgery and work for examinations, especially the Fellowship of the Royal College of Surgeons of England. Inducements were offered me to become a Professor of Anatomy, but I never wavered in my determination to become a surgeon; I was satisfied to work and wait. Then the way opened and took an unexpected turn; in January 1886 I was appointed Assistant-Surgeon to the Middlesex Hospital, and soon incurred the displeasure of my colleagues by my zeal for Abdominal Surgery, specially in regard to pelvic operations on women. Many of my friends have asked me how this came about. The story is clear, and the Zoo in a measure responsible.

When I began work in the Prosectorium in 1881, Mr. P. L. Sclater, Secretary of the Zoological Society, invited me to attend its scientific meetings. At the first meeting I attended, J. J. Lister of Cambridge read a paper on the anatomy of the peculiar reproductive organs of the female kangaroo. He had been dissecting in the Prosectorium, during the absence of Mr. Forbes in the vacation, and as several kangaroos died about that time he had the advantage of an ample supply of material. The subject is of morphological interest; and as it was new to me I determined to follow it actively in all classes of Vertebrates. The material being abundant, I was able to accumulate so much that it enabled me to study the morbid, as well as the normal, anatomy of the mammalian reproductive organs.

I published in 1886 some observations *On Cysts of the Ovaries in Animals.* This article attracted the attention of Alban Doran and Lawson Tait. At that date Doran was closely associated with Sir Spencer Wells at the Samaritan Hospital for Women; he not only assisted Spencer Wells but made microscopic examination of, and published reports on, the Tumours he removed.

Lawson Tait was an able surgeon, specially interested in the Surgical Diseases of Women; he practised in Birmingham and was in open rebellion with the conservative practitioners of Midwifery. Doran and Tait were attracted by my article in the *Journal of Anatomy*; Doran and myself became great friends. Lawson Tait got into communication with me and made an arrangement by which I was to make microscopical examinations and furnish written reports on the specimens he removed from women patients. I fell in with his suggestions, and at the end of a year was thoroughly satisfied that his operative methods were justifiable.

My surgical work at the Middlesex Hospital gave me opportunities not only for the clinical study of these diseases but also for performing operations for their relief, especially as my senior colleague, Henry Morris, was cautious in adopting Tait's methods in view of the prevailing professional opinion. Several of my colleagues were hostile to such operations and my position in the Middlesex Hospital could not be described as a bed of roses. Moreover, about this time matters took a dramatic turn; Dr. Imlach, a Liverpool surgeon, believed in Tait's methods, practised them, and was sued by a man for removing the ovaries from his wife. Lawson Tait gave evidence for Imlach and so impressed the jury that the case was stopped in Imlach's favour. This did not satisfy conservative medical opinion either in Liverpool or in London.[1]

In spite of such proceedings, and in the face of opposition, I continued to perform such operations whenever I considered them justifiable.

In 1892 the Royal College of Surgeons awarded me the Jacksonian Prize. The subject of the dissertation was *Diseases of the Ovaries and Uterine Appendages, their Pathology, Diagnosis and Treatment.* This important Prize was founded in 1800 by Mr. Samuel Johnson, F.R.S., for the best dissertation on a practical subject in Surgery. It is awarded annually, but only when a dissertation is of sufficient merit to justify the award. It is noteworthy that during the last sixty years many Jacksonian Prizemen became leading surgeons in the subject dealt with in their Prize Dissertation. Half a dozen of them are so prominent as to justify mention: Christopher Heath—*Diseases of the Jaw*; Priestley Smith—*Glaucoma*; W. Watson Cheyne—*Antiseptic*

[1] An excellent summary of the Imlach Trail will be found in Stewart McKay's *Life of Lawson Tait.*

Surgery; Frederick Treves—*Intestinal Obstruction*; Anthony Bowlby—*Wounds of Nerves*; James Berry—*Surgical Treatment of the Thyroid Gland.* The Jacksonian Prize is eagerly sought by young surgeons with professional ambition.

Although I was satisfied that Tait's opinions and practice were correct I was sure that his methods of treating his seniors were wrong. The leaders in *Diseases of Women* at that time were such men as Dr. Matthews Duncan, Sir Spencer Wells, and Sir John Williams. Tait was a quarrelsome fellow, rough, and rude. Although I admired his operative ability his statistics were certainly unreliable. He spared no one, not even his friends, and in one of his addresses he described me as being 'filled with transcendental notions in Pathology'.

A few years later the Chelsea Hospital for Women was under a cloud. The operation results were so bad that an inquiry was set up, and a definite attempt was made to close the Institution. The Board of Management with Sir Algernon Borthwick (afterwards Lord Glenesk) took energetic action; rearranged the internal constitution of the Hospital, and appointed a new staff. I had the good fortune to be elected Assistant-Surgeon in 1896, and six months later Full-Surgeon, with fifteen beds. This gave me the opportunity I needed for performing abdominal operations. I combated hostile professional opinion by making my operations accessible to Medical Men and Medical Women from all parts of the world, and by publishing the results in the Reports of the leading Medical Societies and Medical Journals. Every facility was given alike to friend and foe. Gradually opposition ceased.

In 1896 I was appointed Surgeon to the Middlesex Hospital. This enabled me to spend fourteen years teaching in the Hospital I loved so well.

No great change has ever been wrought in Religion, Medicine, or Science without serious opposition. Surgeons in this respect are no better than the silversmiths of Ephesus. I may have won some credit for helping to put this class of surgery on a sound footing after dragging it out of obloquy which at one time threatened to overwhelm it.

ANÆSTHESIA. ESCAPE FROM PAIN

In my early days as a surgeon the induction of anæsthesia for an examination, or an operation, with ether, or chloroform, was a rough-and-ready proceeding. Struggling with a strong man, during the administration of ether, was often distressing and unpleasant; accident not only added to the risks of an operation but sometimes caused the death of a patient. Occasionally the surgeon, and others engaged in the proceedings, received kicks and blows as in a scrimmage.

In 1884 I was called in consultation on a footman, a big fellow 6 feet 4 inches in height. In order to make a satisfactory examination it was necessary to anæsthetize him. Ether was selected and administered by the doctor. The examination was conducted in the basement of a large house in Park Lane, where the footman was employed. As soon as I received the signal from the doctor that the patient was 'under' I began the examination—in an instant the man sat up, sprang from the bed and began to punch, wrestle, and knock us about like skittles. I received a severe blow on the jaw.

The housekeeper, hearing the noise, rushed into the room, and alarmed by the scuffle fetched a blacksmith, who happened to be at work in the basement. He helped to restrain the footman; gradually his excitement subsided and unconsciousness supervened.

Exciting struggles of this kind were common in the early days of anæsthetics, but happily they are now incidents of the past. Discoveries of new anæsthetics, and especially improvements in the art of inducing anæsthesia, have rendered their use free from risk—even free from discomfort.

The discovery of the anæsthetic property of cocaine has made it possible to produce insensibility to pain without inducing unconsciousness—conscious anæsthesia.

In Ophthalmic Surgery, a general anæsthetic was a boon which enabled the surgeon to extract a cataract painlessly, but the squeezing of the globe which attended post-anæsthetic vomiting was sometimes disastrous to the eye. In 1880 when I watched operations in Paris, in some of the special clinics, many operations were performed on eyes without the aid of an anæsthetic. One afternoon I saw Galezowski in Paris operate on six patients without this help. Some bore the operation stoically; others resisted and the surgeon lost his temper. I asked one man who had borne an iridectomy for glaucoma with remarkable fortitude, to describe his experience: he replied, 'When the knife entered my eye it seemed like a flash of lightning!'

In 1876 Edward Payson Weston, an American pedestrian, attempted to walk 500 miles in six consecutive days. The walk took place at the Agricultural Hall, Islington. Near the termination of the sixth day Weston had completed 450 miles; a pistol was fired and he withdrew from an impossible task.

I was living near the Agricultural Hall in 1876 and on one of the days looked into the arena and saw Weston walking and was astonished at his briskness. My interest in this affair was quickened by the story that he was able to endure the fatigue by chewing coca leaves! These leaves are chewed by Peruvian Indians; the juice

of the leaves benumbs sensation of hunger and fatigue, and they have been used as a masticatory from time immemorial. Coca bushes grow freely on the mountain-sides in Peru, Ecuador, and Bolivia, and the leaves were chewed by the priests for psychic stimulation during religious ceremonies.

About ten years after Weston's walk I was Assistant-Surgeon to the Middlesex Hospital and saw the Ophthalmic surgeon instil into the eye of a patient a few drops of a solution of cocain and extract a foreign body stuck in the cornea. The proceeding was painless. Cocain is an alkaloid extracted from coca leaves.

From such simple purposes the use of cocain as a local anæsthetic quickly extended for minor surgical procedures; its special action being exerted on the sensory nerves. Surgeons soon realized that there were risks attending the use of cocain, and clever chemists soon acquired methods of depriving it of deleterious elements, and in the form of novocain it is the safest and most valuable agent for local anæsthesia—boon and blessing to patients and surgeons.

Novocain is especially useful for inducing temporary anæsthesia of the sensory roots of spinal nerves employing the cerebro-spinal fluid as a medium. In this clever method a solution of novocain injected into the intradural space freely mingles with the fluid and benumbs the posterior roots of the spinal nerves. This permits such operations as amputation of the lower limb, removal of abdominal tumours and similar operations on the body, below the level of the diaphragm, to be performed without pain and without depriving the patient of consciousness.

It is extremely useful also in local operations. With the aid of a subcutaneous injection of novocain a definite area may be rendered anæsthetic for simple surgical operations. Injected into the sheath of a nerve the area

of the skin supplied by the nerve is temporarily benumbed. This method is known as nerve-blocking.

The story of cocain and the consequences for mankind which followed a combination of Botany, Chemotherapy, and Surgery may be described as magical!

Although ingenious instruments have been invented for estimating weight, temperature, and speed, no one has succeeded in devising an instrument for measuring Pain or estimating Fear, for example: In December 1908 I was in Vienna, and my host wished me to visit a well-equipped Jewish hospital; there I saw Zuckerkandl, a Viennese surgeon of repute, perform an operation with the aid of spinal anæsthesia on an aged Jew. When the surgeon made the incision the patient complained in piteous tones, 'O Weh! O Weh! O Weh!' The surgeon desisted at once and asked the man if he felt pain. He replied, 'Nein, Nein.' Then the surgeon asked, 'Why do you complain?' To this the Jew replied, 'You know it is the way of my people!'

In 1879 I saw T. W. Nunn, the Senior Surgeon of the Middlesex Hospital, remove a piece of dead bone from the heel of a sailor who had been wounded by a bullet in an encounter in the Arabian Sea. I do not know what astonished me most—the coolness of the surgeon who so deliberately cut the man, or the courage of the patient who submitted without flinching. After the bone had been removed Nunn washed out the wound with a solution of chloride of zinc. This stung the patient; he waved his hand to the students in the gallery as he was wheeled out of the room!

I have had several small operations and in my early days submitted to them stoically. Three operations have been performed under local anæsthetic—gas and anæsthesia—novocain; and three under a general ether. A general anæsthetic administered by an anæs-

thetist of experience is so safe that few shrink from it when a serious operation is required, and in later years when I required the active attention of a surgeon I preferred gas and ether. There is one recorded case in which a surgeon administered an anæsthetic to himself for the purpose of an operation:

Dr. E. L. Doyen, a French surgeon possessing unusual dexterity, and who separated the Orissa twins, Radica—Doodica, had an intense craving for popularity. In 1906 Doyen's appendix required removal and as he could not remove it himself, the operation was performed on the following lines:

Doyen selected a former assistant to operate and made the preparations himself, and administered the anæsthetic —ethyl chloride—to himself. In about ten seconds he felt himself 'going' and gave the signal to the surgeon. A few drops of chloroform were also administered. On recovering consciousness Doyen insisted on examining the appendix in a bottle, and dictated the details of his surgical adventure to be reported in the *Echo de Paris*. In relation to this theatrical display, a witty English surgeon wrote: 'The chief point of interest is the fact that the Separator of United Twins, the Gelder of Lions—the King of Surgeons operating on the King of Beasts, should himself be overcome by an ailment which had so often yielded to the touch of his knife.'

It is unusual to get a frank opinion from a lay visitor who has been allowed to witness surgical operations.

A friend of mine had a nephew who could not make up his mind whether to please his father, uncle, or his own instinct. The lad wished to be an engineer; his uncle would like him to be a surgeon. In this dilemma I was asked to allow him to spend an afternoon with me in the operating-room. The boy willingly attended and watched me perform half a dozen major operations with

close attention and obvious interest. We had tea together and he left the hospital in a thoughtful mood.

A week elapsed; I met his uncle and asked if the boy had made his choice. 'Oh!' he replied, 'I had a curious talk with him and among other questions he asked, "Were those operations I saw considered to be difficult?"' My friend scratched his bald head and replied, 'Yes, they are called capital operations.' 'Oh!' said the boy, 'and that young fellow can do them so easily and so quickly! There's not much in Surgery—I shall be an engineer.'

My first operation on a private patient was the removal of a tumour from the leg of a woman living in a village near Oxford. The incident is impressed on my memory because the patient resolutely refused to have chloroform and bore the operation stoically. Her doctor was a facetious fellow and unwisely quarrelled with the Vicar, who disliked and distrusted him. The Vicar advised his parishioners when they were ill not to drink the doctor's physic, but to swallow Blair's Gout and Rheumatic Pills! To counteract this, the doctor informed the Vicar that if he continued this malicious advice he would obtain a gross of Spurgeon's Sermons, distribute them, and advise the villagers to read these wonderful sermons on Sundays in preference to listening to the Vicar's feeble preaching! Doctor and Vicar were reconciled.

Surgeons are often useful in courts of justice, especially in the investigation of murders. About forty years ago an old blind man, named Fifield, was frequently seen walking past the Middlesex Hospital led by a dog and ostensibly selling bootlaces. This man lived with his wife near King's Cross Station. She was a small, feeble, old woman, but the blind man was tall and strong. One evening the couple retired to their room and in the morning the woman was found dead on the floor. It was known by the neighbours that the blind man was a

quarrelsome fellow. The corpse was conveyed to the parish mortuary; Danford Thomas, the coroner, ordered a post-mortem examination and the doctor in charge of the case asked me to be present. There were no signs of external injury, but on proceeding with the examination I found to my astonishment seventeen fractures of the ribs. Some of the ribs had been broken in two places. I was puzzled; such severe injuries could only be caused by great violence. It was undeniable that there had been a struggle in the room and Fifield had in some way injured the woman's chest. I thought he had knelt on her, but the number of fractures puzzled me; they resembled the injuries found in human beings crushed to death in a crowd. To make the matter certain for the inquest I carried out some observations on dissecting-room subjects and convinced myself that as the poor woman lay on her back on the floor of the room her husband stamped on her chest with his boots on!

This man was tried before Mr. Justice Hawkins at the Old Bailey, and the jury found him guilty. As the murder was unpremeditated the Judge took the prisoner's blindness into consideration and sentenced him to six months' imprisonment. After the jury had found Fifield guilty he was proved to be a scoundrel, and had been sent to prison on several occasions for theft and especially for passing counterfeit coin.

Some months after the trial the coroner sent me a cutting from a Newcastle newspaper containing an account of a brutal murder: A man quarrelled with his wife in the street and, in the presence of a crowd, threw her on the ground and stamped on her chest. He was wearing thick boots. The poor woman died. The injuries found at the post-mortem examination were described at the inquest. They corresponded in every particular with those I had found in Fifield's unfortunate wife.

Danford Thomas sent me the newspaper cutting because the facts confirmed my evidence in the trial of Fifield at the Old Bailey. He thought I had strained the evidence against the prisoner, but after reading the report of the Newcastle case he was convinced that my evidence was correct.

The love of animals is innate in the worst of us. When Fifield's solicitor wanted money for his defence he refused to sell his dog. His counsel made a point of this at the trial by ending his speech for the prisoner in this dramatic style: 'Could this blind man be guilty of such a monstrous act as stamping on his little wife when she was helpless on the floor; a blind man! who for his own defence refused to sell his Old Dog Tray!'

SPECIALISM AMONG THIEVES

There is specialism among thieves as well as among surgeons. My interest in this matter was stimulated on learning that a thief, who had been arrested for stealing shoes, confessed that the temptation to steal shoes exposed for sale was to him irresistible!

The following example of specialism in crime came under my notice in the Middlesex Hospital:

On making a visit to my ward I found a man, aged 35, lying in bed with an injury to his head and a broken jaw. He walked into the out-patient room the previous evening complaining of a wound in his head caused by a fall. The house-surgeon on duty, appreciating the gravity of the injury, admitted him to my ward.

The following morning a police sergeant called at the hospital to inquire 'if an accident case had been admitted in the night'. After consulting the admission book, the sergeant produced the crown of a molar tooth; this he had found on the floor of the vestry of a neighbouring church which had been entered by a thief, or

thieves, the previous night. It appears that the burglar entered the church through the window of the organ-loft, and in order to reach the vestry it was necessary for him to jump across an open space about four feet wide. The thief missed his footing and fell on the floor of the vestry several feet below. In the morning the person in charge of the church, discovering that the vestry had been disturbed, sent for the police. A sergeant examining the room found blood-stains on the floor and the crown of a molar tooth! My house-surgeon took the piece of tooth and found it accurately fitted a broken tooth in relation with the fracture in the patient's jaw.

The sergeant then ordered the man's clothes to be removed in order to prevent him escaping. In due course, when the burglar's wound had healed, he was brought before the magistrate and recognized as a man well known to the police; his speciality was robbing churches! Apart from this curious propensity he seemed a decent fellow, and as on this occasion he had not stolen anything, but had sustained a serious personal injury, the magistrate treated him leniently.

THE CADDIE AND THE CLUB

It is worth remark that a surgeon may be concerned with many accidents which individually leave no permanent impression on his mind. Here and there one persists vividly in his memory because it is, to use a colloquialism, something out of the usual run. Of this the following story is an example:

One afternoon, on making my usual visit to the boys' ward, I saw neatly resting on the pillow of the bed in which a boy was lying, a small rounded head; as the hair had been closely cropped, which is the practice in head injuries, it appeared as round as a ball. On the right temple, I could see a horizontal depression an inch

in length, with neatly rounded ends, and sharply defined margins. It exactly resembled the depression made by a golf-club—a driver—on a ball of clay. I at once asked the boy, 'Has someone mistaken your head for a golf-ball?' The boy merely grinned. My house-surgeon explained that the boy was a caddie and on the links he quarrelled with another caddie—an older boy—who, to check his impudence, smote him on the head with a driver!

The injury to the caddie was, in surgical terms, a gutter-fracture, and he made a good and lasting recovery. It was the shape of the depression on the boy's head which arrested my attention and fixed this unusual injury in my memory.

ST. ANTHONY'S FIRE—ERYSIPELAS, AND THE EVOLUTION OF NURSING

St. Anthony's Fire was the name applied by herbalists to the disease now known as erysipelas. Its history bears on the Evolution of Nursing.

Until the value of Antisepsis began to be appreciated by surgeons, post-operative erysipelas was a scourge. Fifty years ago it was a common complication of compound-fractures and surgical wounds. Surgeons knew that erysipelas is easily and frequently conveyed from one patient to another in a surgical ward; and it was the practice as soon as the initial redness—accompanied by fever—became manifest in the skin around a wound, at once to isolate the patient; or better, remove him from the ward. In such circumstances, in the Middlesex Hospital, when erysipelas occurred in patients in the surgical wards they were transferred to a room in the basement, and entrusted to the care of an Assistant-Surgeon. Soon after my appointment to the Surgical Staff, a broken-down, intemperate old cabman was

admitted; he had sustained a compound-fracture of the leg. A few days after his admission into the male accident ward erysipelas declared itself in the damaged limb, and the old man became delirious. In accordance with the routine practice he was sent to the erysipelas-ward under my care.

At this date (1886) the special wards for septic and delirious patients were in the basement of the hospital, among the store-rooms, kitchens, the carpenter's shop, smithy, laundry and coal-cellar. The surgical nurses did not look after them, but untrained women called emergency nurses—real gamps—were employed.

My first visit to the old man was made in the evening of the day he was transferred:—I found him in a dark, ill-conditioned, ill-ventilated, dismal ward in charge of a 'special' nurse, who sat half asleep in an arm-chair. She smelt strongly of gin! The patient was delirious and loquacious. In spite of his broken leg he was sitting in the bed holding the counterpane and sheet as if they were reins. This old cabman was under the delusion that he was driving his old mare and urging her by moving his right arm as if gently flicking her with a whip and uttering friendly phrases such as: 'Gee up, old girl! Hold up! Steady—steady, I say. Gee up!' He appeared indifferent to my presence.

After watching him for a few minutes, I proceeded to inspect the damaged limb. This aroused the 'nurse' and without rising from her chair the snuffy, drunken woman exclaimed: 'Now, young man, if you know'd what's the matter with that poor old cabby you wouldn't dress 'is leg, and it isn't safe to go near the bed.'

I dressed the injured leg, and readjusted the splints and made the old fellow comfortable. He died the same night. This episode ended the career of this 'special nurse' so far as Middlesex Hospital was concerned.

At that period a new interest was dawning for surgical nursing. The discovery, in 1883, that erysipelas is caused by a microbe—a streptococcus—explained the occurrence of this infection in dark, ill-ventilated wards with defective sanitary arrangements, in pre-antiseptic days. Post-operative erysipelas is very contagious, easily conveyed from wound to wound by sponges and the dirty fingers of surgeons, dressers, and nurses; instruments, and splints. The need for greater care in Antisepsis became obvious in view of Pasteur's discoveries of the relationship of micro-organisms to disease.

The importance of training nurses in the principles of antisepsis is appreciated by surgeons, especially in relation to the infective discharges from ulcers and septic wounds.

At the time of my experience with the delirious cabman, the Middlesex Hospital had the good fortune to have an admirable and enthusiastic Lady-Superintendent —Miss Thorold—who, with the whole-hearted support of the Weekly Board, remodelled the Nursing Department and established a well-organized School of Nursing. She strove hard—and succeeded—in replacing sick-attendants by well-trained and capable nurses. Moreover surgeons soon perceived that patients with post-operative erysipelas demanded skilful nursing, diligence, and watchfulness; and that light, ventilation, nutritious diet and strict cleanliness are as important as surgical supervision, drugs, and the judicious use of antiseptics.

Nowhere in surgery does the maxim, 'Prevention is better than cure', apply more forcibly than in the treatment of post-operative erysipelas.

When surgeons appreciated these facts, this dread sequel of accidents and surgical operations became a rarity; so rare indeed that in my practice—hospital and private—I have not seen a case of post-operative erysipelas for forty years.

In my early days this disease was common in every surgical hospital in the United Kingdom. It is worth recalling that Lister's first success with carbolic acid as an antiseptic was obtained in a lad with a compound fracture of his leg (see p. 110).

Miss Thorold's efforts to improve the style and status of nurses are unique in the annals of the Middlesex Hospital. After thirty-five years of strenuous work she retired in 1905, beloved by all.

THE CLINICAL THERMOMETER

My acquaintance with Miss Thorold began in a curious way:—Wunderlich's book on *Medical Thermometry* appeared in English about 1871. Previous to the publication of this important book, surgeons and physicians estimated the body-temperature by hand—a most unreliable instrument for this purpose. When surgeons recognized the value of the thermometer there arose an unseemly squabble between the staff and Miss Thorold—who was to take temperatures—the dressers or the nurses. When I began my dressership in 1879 the strife was bitter. To avoid trouble, Hulke supplied his dressers with clinical thermometers—clumsy, but reliable. The value of regular temperature records was soon recognized by physicians and surgeons; reliable and handy thermometers were constructed by scientific instrument makers, and accurate observations were insured by self-registering thermometers; well-trained nurses 'took temperatures' at regular intervals and prepared trustworthy charts.

It is now the duty of a trained nurse to keep a record of the variations of a patient's temperature and record it on a chart. In my experience, it is a duty in which they delight.

The thermometer is as indispensable in Clinical Work as the Compass in Navigation.

CHAPTER VI

SURGERY AT SEA

SINCE 1880 I have made half a hundred voyages to various parts of the Eastern and Western Hemispheres in ships varying from a 5,000-ton collier to the *Mauretania* and the *Lusitania*. On several occasions I have been called upon to render surgical aid to officers or members of the crew and to passengers.

My first experience was amusing. In September 1883 I went to Lisbon on a merchant ship. The second day out on going on deck the Captain introduced me to the Bo'sun, who had a request to make. After some hesitation he asked me shyly if I would be kind enough to castrate the cat! I acceded to the request, and subsequently the cat became my friend.

In 1918, when the Germans were busy sinking British merchant ships, it occurred to Mr. H. A. Gwynne, editor of the *Morning Post*, that a series of articles in his journal giving some idea of the methods, dangers, and difficulties incurred in convoying merchant ships would be acceptable to the public. He discussed the matter with Sir Douglas Brownrigg, the chief Naval Censor at the Admiralty, and it was agreed to send me as correspondent to Halifax, Nova Scotia, or to New York, and return on the cruiser escorting a convoy of merchant ships. I was invited to undertake the duty and accepted it. In March 1918 I left Liverpool and landed at Halifax and returned to Glasgow on the escorting cruiser.

On the second morning after leaving Halifax a signal was received from one of the ships that a man on board required medical aid. Could a doctor be sent? The convoy at this time was at the south tail of the Bank of Newfoundland. A boat was lowered and a surgeon went aboard. He signalled that the Cook's Mate required some surgery and would need it for some days. The Captain of the cruiser asked my advice and I suggested that the patient should be brought on board the escort. The transfer occupied half an hour and all ships in the convoy hove to. This little incident illustrates what has been called the Omnipotence of Surgeons. A cook's mate required simple surgical aid; the cook referred to a book on Domestic Medicine and had tried to help his mate, but unsuccessfully. For half an hour 160,000 tons of shipping stopped in mid-ocean in order that surgical aid could be rendered to a cook's mate while submarines might be busy around.[1]

I had a graver experience than this under the equator in the South Atlantic. It was lunch-hour and sitting next the Captain I noticed his mouth was somewhat awry; then he selected an apple and suddenly dropped it, and his right arm fell to his side. Recognizing it to be a paralytic seizure I crossed the dining-room to the ship's surgeon and the nurse and asked them to assist the Captain from the saloon to his cabin, and as they went up the companion-way to the Officers' Quarters, his right leg gave way. Two hours later I met the surgeon and asked after the patient. He replied, 'I have made him comfortable in bed and put the Chief Officer in command of the ship!' I said, 'This is rather bold'; he replied, 'I knew you would support me in this, and it is within my power'. On reaching Pará, a consultation took place with the Company's doctor and

[1] 'The Tale of a Convoy.' In my *Selected Letters and Essays*, 1920.

communication was made with the Head Office in Liverpool. The surgeon's action was endorsed.

On a voyage to Cape Town I was able to perform an important operation in mid-Atlantic on a friend, and kept it so quiet that not more than ten persons knew that anything untoward had happened on the ship. The operation was attended with the happiest consequences. The Captain was grateful because I did not have the ship stopped.

Kipling, in a delightful address to the students of the Middlesex Hospital in 1908, on 'A Doctor's Work', has this fine reference to the power of the ship's surgeon at sea: 'He can forbid any ship to enter any port in the world, and if he thinks it necessary to the success of any operation the surgeon can stop a 20,000-ton liner with mails in mid-ocean till the operation is completed'.

It is unwise, and I am sure rarely necessary, to stop a ship whilst an operation is performed at sea. In 1924 three days out of the port of Boston, on a 20,000-ton liner, I was called upon to operate for acute appendicitis on a stout, able, and amiable Captain. Several days passed before the news filtered through the ship that the Captain had been the subject of an operation. The Cunarder on which this incident occurred had a surgical department admirably arranged and equipped. The operation was performed in the Captain's room. When the ship reached Liverpool I superintended his transference to the hospital. He had a long and serious illness but happily recovered, and I have since had the pleasure of crossing the Atlantic with my former patient in command.

Surgery at sea on a well-found steamship is occasionally a serious adventure, but on a sailing-ship it is worse. In my early days as a surgeon, the chief officer of a sailing ship came under my care with the following story:

A derrick-boom fell upon him during a voyage in the

Atlantic Ocean, and dislocated his hip. The Captain tried to reduce it in the following manner: The patient drank half a bottle of brandy and fifty drops of laudanum; being drunk he was fastened by a band to a ring-bolt on the deck and ten seamen, under the superintendence of the Captain, hauled steadily on the leg. Their efforts were unavailing. Four days later the ship touched the Canary Isles and the officer was sent ashore. The dislocation was quickly reduced by a surgeon with the aid of chloroform. On recovering, the patient was unable to walk without pain. I saw him in London and was of opinion that the pain was due to a piece of bone pricking the great sciatic nerve. I exposed the nerve through an incision in the buttock and found a hook-shaped piece of bone on the rim of the acetabulum (which had been broken by the efforts of his shipmates) in such a position as to stick into the nerve when the limb was extended. This was removed and all pain ceased. I saw the officer twenty years later in excellent health.

The methods adopted by the Captain and the crew to reduce the dislocated hip of the Chief Officer were precisely those employed by surgeons, in hospitals of repute, before the discovery of the anæsthetic properties of chloroform. Even after the utility of chloroform in operative surgery was recognized, it was many years before its advantage in producing relaxation of muscles was appreciated in the reduction of dislocations. In the Middlesex Hospital, the ring-bolts in the floor, the bars on the walls, and the tackle for reducing dislocations in the out-patient room, and the operating-theatre, were not abolished until 1895. The last time I saw a dislocation of the hip reduced in this Hospital with pulleys was in 1880.

In the old days of sailing-ships, surgery at sea was rough and ready. There is a specimen in the Museum

of the Middlesex Hospital which I watched with jealous care for many years. It is instructive as well as historical: it is a portion of a human thigh-bone with an ivory peg in it. This is its history: The Captain of a whaler broke his thigh in the South Seas and as there was no surgeon on board, the sailors put the broken limb in splints. Some months later, he was admitted into King's College Hospital, London, with an ununited fracture. Sir William Fergusson rubbed the fragments forcibly together; subsequently he scarified them subcutaneously; and later inserted an ivory peg between them. As no union followed, Sir William amputated the limb. Secondary bleeding occurred after the flaps had partially healed, for which Mr. J. W. Hulke tied the superficial femoral artery. An aneurysm formed at the seat of ligature. The patient died a few months later. Hulke was Assistant-Surgeon to Fergusson and brought the specimen to the Middlesex Hospital when he migrated from King's College Hospital in the Strand.

WAR SURGERY

I continued to pursue surgery steadily at the Middlesex Hospital until interrupted by the Great War, August 1914. In December 1906 I accepted a Commission as Captain in the Royal Army Medical Corps, Territorial Force, never dreaming that any service would be required of me. On 1 August 1914 I delivered the Address on Surgery at the meeting of the British Medical Association at Aberdeen, and the following paragraph opened the Address:

'The Art of Surgery is probably as ancient as the Art of War, and is practised by warlike savages who have never been influenced by civilization. The antagonistic callings of the soldier and the surgeon have been markedly modified by the progress of science. It is believed by many that the ingenuity exercised in the invention of method for destroying life, will make war impossible; the discovery of the causes of diseases,

and the perfection of preventive medicine, will render physicians and surgeons unnecessary. The belief in each instance is futile. Soldiers and surgeons will be required as long as civilization endures; but their methods have undergone great changes and greater are impending. Gunpowder revolutionized warfare; the discovery of anæsthetics and the invention of the microscope completely changed surgical methods.'

I had made arrangements to spend a holiday in China and Japan *via* the Trans-Siberian Railway, leaving London 4 August. I left Aberdeen the day after the *Address* was delivered, having been honoured in the meantime with an LL.D.; and on reaching London learned with astonishment that all traffic through Belgium was stopped. Two days later Great Britain declared War on Germany. I was immediately called up, and attached to the 3rd London General Hospital, Wandsworth, as a Captain. I was content to remain with this modest rank in order to obtain practical experience of gunshot wounds. The wounded soldiers soon came in abundance from the battlefields of the Aisne and the Marne. The fighting forces moved so rapidly, and the transport arrangements were so incompletely organized that many of the soldiers reached Wandsworth four or five days after the battle in their first field-dressings. Their wounds were corrupt and sloughing. Septic wounds of this kind were a revelation to the younger surgeons and a shock to older men. Many junior surgeons saw for the first time patients suffering from tetanus. Gradually matters improved in France and the wounded were brought to England in better condition.

In the second year of the War the hospitals were better equipped and staffed by civil surgeons, and many acute cases were detained in the base hospitals in France.

In the meantime having become a Major and sat on Medical Boards and similar duties (*Plate IV*), I asked the Director-General, that as the surgical work had

become systematized and could be carried on by the younger men, to relieve me. I had served for two years at the 3rd London General Hospital and at the same time worked hard in my wards at the Middlesex Hospital.

In 1916 I was nominated to serve on the Special Medical Board which met at Millbank. This was an Appeal Board for men who considered themselves unfit for active military service. Colonel E. H. Lynden Bell presided. Sir Frederick Treves, Sir William Hale White, Mr. F. F. Burghard, and Sir Charles Ryall also served. Then there arose a public protest against the methods of recruiting. The question was investigated by a Special Committee of the House of Commons and this led to the control of the Special Medical Board being transferred to the Local Government Board. I had served for a year and did not wish to continue under the new arrangements, mainly because the control was no longer under the War Office.

At the beginning of the War a Committee was appointed to compile a Medical History of the War; some of the members appreciated the importance of establishing a Museum collection of specimens demonstrating the effects of modern projectiles. Case-reports came over in abundance, but not actual specimens. Sir Alfred Keogh, Director-General of the Medical Service at that time, appointed me War Office Representative with the rank of Lieut.-Colonel for the purpose of collecting specimens illustrating gunshot injuries. In March 1917 I went to Paris and studied the French War specimens exhibited in the Museum at the Hôtel du Val de Grâce. Sir Arthur Sloggett, who was interested in the question, met me in Paris and together we went to General Headquarters at Hesdin. In company with Sir William Macpherson, I went to the fighting line at Arras and the first-aid hospitals in the vicinity, and explained to

THE AUTHOR IN 1914

MAJOR R.A.M.C.(T.)

the surgeons the kind of material that would be required for the Museum. On my return to Boulogne, in company with General Sawyer I visited the base hospitals for the same purpose.

After this visit the supply of specimens became ample and the Royal College of Surgeons agreed to accept and store them until the conclusion of the War.

At that time I was not only a Member of Council at the College but also a member of the Museum Committee. I remained the War Office Representative until the Collection was finally entrusted to the College on the same terms as the Hunterian Collection.

Great credit is due to Mr. Cecil Beadles for the extreme skill and care with which he dissected and prepared the specimens. The Collection is well arranged and conveniently displayed for examination; it is unrivalled as an exhibition of War Wounds and Diseases incidental to War.

For my services during the War I was allowed to retain the rank of Lieut.-Colonel and in 1924 appointed Knight of Grace of the Order of St. John of Jerusalem in England.

In 1919 I wrote an article for the *British Journal of Surgery* giving an account of some of the vagaries of bullets, and the extraordinary routes by which many of them find their way into strange places in the human body.

Among the wounded soldiers from Gallipoli was an Australian Colonel—in private life a prominent lawyer. A bullet entered his lower abdomen and lodged in the pelvis. At Alexandria an attempt made to remove the bullet failed. Eventually the Colonel was brought to England and arrived at 3rd London General Hospital where, after careful observation, I became satisfied that much of the patient's neurasthenia was due to the con-

sciousness that the bullet remained hidden in his body. After a thorough X-ray examination I assured myself that the bullet was lodged in the tuberosity of the right ischium. A few days later I decided to attempt its removal, and while the operation was in progress the Colonel-in-charge came into the operating-room and asked: 'Have you found the bullet?' At that moment I was extracting the missile from the tuberosity of the ischium; handing the bullet to the Officer, I asked, 'Why are you so anxious about it?' He replied: 'A telephone message has just come through from Buckingham Palace, H.M. The King wishes to know if the bullet has been found in Colonel X.' A few days later the King visited the hospital and interviewed the Colonel, who quickly recovered.

The tallest soldier who came under my care for a gunshot wound during the Great War was 6 feet 4 inches in height. While charging the enemy a bullet damaged his little toe. The wound became septic and he was ill many weeks, but recovered. A soldier may have a finger, or a toe injured by a bullet, or a fragment of a bomb, and die from sepsis; another may have his chest, abdomen, or a limb traversed by a bullet and recover after a temporary indisposition.

A singular injury happened on Armistice Day, 11 November 1918: Shortly before eleven o'clock a stout cook, Jane P——, aged 50, and her kitchen-maid, stood at the top of the area steps listening for the report of the Armistice Gun. When the bomb burst something struck them, and the cook realized that she had been wounded in the foot. She was conveyed to the Middlesex Hospital and placed under my care. Subsequently I removed a curled fragment of metal, from her foot; it was a fragment from the case which contained the bursting charge of the bomb. This fragment is

preserved in the Museum of the Middlesex Hospital. Jane P—— may regard herself as receiving the last gunshot wound of the Great War.

AN ADVENTURE ON THE BAYSWATER ROAD

During the Great War at a time when London was liable to air raids all artificial illumination at night was, as far as possible, abolished. The darkness made the roads dangerous. One evening while slowly proceeding in my car along the Bayswater Road, I suddenly felt a bump! The car stopped at once; I sprang out and perceived in the dim light an elderly man lying full-length in the road. A few yards further on was another man lying under a taxi-cab. These men had been pushing a truck along the road and a taxi-cab knocked down one of them. His companion, hearing another car coming, walked back to give warning and was knocked down by my car. The poor fellows lay full-length in the road like two overthrown skittles. We put them in the taxi-cab and instructed the driver to convey them to St. Mary's Hospital, Paddington. I kept my appointment and then went to the Hospital and saw the men; the only serious damage they sustained were cuts on the head, and these were being cleaned and dressed by the nurse. I thanked her for the care and neatness with which she dressed their wounds.

Some years later Prince Arthur of Connaught accepted the post of Chairman of the Middlesex Hospital in succession to Lord Athlone, who had been appointed Governor-General to South Africa. There was a meeting held for the purpose of introducing Prince Arthur to the Medical Staff. Princess Arthur was also present and the Prince, to my great astonishment, presented me to the Princess as the man who had complimented her for

so skilfully dressing the heads of the two men who had been damaged in the Bayswater Road. Princess Arthur was much amused and said, 'Had I been aware of your identity when watching me, I could never have completed the dressings!' The Princess is a splendid surgical nurse and loves the work.

THE SOLOVETSKI MONASTERY

PRIESTS AS APOTHECARIES

In 1912 I spent Christmas in Moscow with my wife and made inquiries as to the possibility of reaching the Island of Solovetski in the White Sea, our desire being to visit the famous Monastery and Cathedral on that island. We communicated with Archangel and in reply received the subjoined telegram:

'The White Sea is frozen and in order to reach the island the journey must be made by sledge over the ice; part of the journey is through forests where wolves are unusually abundant and to be feared.'

We also had to take into account the shortness of daylight—about three hours—in mid-winter. A visit to Solovetski for us at that time was out of the question.

In August 1913, with Mr. H. A. Gwynne, I visited the island, reaching it by sea. We obtained a passage in a ship laden with coal and set out from Blyth, near Newcastle-on-Tyne, for Archangel. The journey was rough but amusing. The ship traversed the North Sea, crossed the Arctic Circle and passed among the Lofoton Islands, rounded the North Cape, entered the White Sea and landed us with the coals at Archangel.

During the voyage we amused ourselves helping to clean the decks and stoke the fire: occasionally we were allowed to take a turn at the wheel. It was light all

night and when lying in the cabin I could watch swarms of cockroaches running about the walls. The food ran short, and when we came across a fishing-boat, managed to obtain some fish. At first the freshly caught fish was delightful, but when we had cod for breakfast, cod for lunch, and cod for supper eight days in succession, we found the meals monotonous. On landing at Archangel we obtained some money from the bank, found an excellent restaurant, enjoyed a delightful Russian lunch and effaced thé unpleasant memories of the journey with some excellent vodki.

Solovetski is 166 miles from Archangel and during the short summer a good steamer, managed by monks, runs twice weekly between Archangel and the island. On the island we obtained gratuitous accommodation in one of the *hôtelleries du couvent* and found the gulls so tame that they came to the window of our room, tapped the panes with their beaks demanding admission, and when admitted they hopped about the table eating cloister bread. They were as tame as poultry.

During the short summer season thousands of pilgrims arrive at the Monastery. Many sick persons in the last stages of chronic and incurable diseases go to the cathedral seeking miraculous cures. Wandering about the cathedral I came upon a crowd of sick folk receiving from a Russian monk potions, pills, liniment, and ointment. These things are prepared from the herbs which grow in the island. While watching the crowd of sick persons in the sanctuary I thought of the great part played by religious teachers as healers of disease, and especially as herbalists and apothecaries. Man, primitive and civilized, is dominated by fear of disease and death. In combat he forgets danger and death, but the insidiousness of disease and ignorance of its cause fills the mind with fear. Next to belief in the existence of a

future state of permanent bliss, nothing is more deeply rooted in the mind of Man than faith in drugs.

Disease was regarded as something which entered the body, and the idea of evil spirits entering men and women has been entertained from the earliest period. It is not surprising that the treatment of disease should have been in the hands of priests!

Students of the Pentateuch know that in the service of the tabernacle certain priests were set aside as perfumers and apothecaries. They prepared the anointing oils for the priests, incense for the ceremonies, and remedies for the sick persons. Incensing the congregation was not only ceremonial but also an act of fumigation. All who have mixed with a crowd of religious enthusiasts in an Eastern place of worship appreciate the value of incense.

The art of preparing ceremonial perfumery may have laid the foundation of pharmacy. Collecting gums, resin, scented-wood, flowers, pungent herbs, and astringent roots led to the extraction of essences, and the preparation of pastilles for convenient use by priests in the services and sacrifices; pills, powders and potions for administration as medicine.

The directions for the preparation of anointing oil were set down with the precision of a modern prescription. The ingredients were pure myrrh, cinnamon, sweet calamus, and olive oil; it was compounded with the art of the apothecary. Anyone who compounded anything like it was to be 'cut off from the people'. It is clear that proprietary right in a prescription is no new thing. Moses acquired his knowledge of pharmacy from the Egyptians who have been described as a Nation of Druggists.

Many drugs in a pharmacy are silent witnesses of the curious mixture of faith and science entwined in the Practice of Medicine.

We left Archangel by train for the long and tedious

journey to join our wives in Moscow. We started at 9 a.m. and found in conversation with a bright Frenchwoman that the train travelled slowly, stopping at every station, but not long enough to allow the passengers to lunch or dine; moreover there was no luncheon-car. We could obtain German beer at stations here and there; and the guard of the train supplied tea.

We felt uncomfortable at the news and resigned ourselves to a fast. Exactly at noon this kind Frenchwoman came to our compartment with a parcel, which she offered us—it contained two veal chops, bread and cakes! It was part of her own *déjeuner*! Two minutes later there was a tap at the door; our benefactor had returned with something screwed up in paper; presenting it with her fingers she said: '*Pardonnez-moi, j'ai oublié le sel.*'

Some years later, in an after-dinner speech in the City, I related this story and added that we were much better off than Elijah, when in hiding by the brook Cherith, although ravens brought him bread and meat, there was no ministering angel to bring him a pinch of salt!

In order to emphasize the value of salt with food I mentioned that freshwater fishes living in an aquarium are apt to be costive. This discomfort can be relieved by adding salt to the water. Should this be insufficient it may be usefully supplemented by Epsom salts.

After dinner a witty Doctor of Divinity, who happened to be present, said to me, 'This is the first time it has been suggested that Elijah suffered from constipation!'

In 1918 a British force was sent to Murmansk, the terminus of the Petrograd-Murman Railway, and the only port on the North Russian Coast that remains ice-free throughout the year. It was also expedient for the Allies to occupy Archangel. Hospital-ships sent to Archangel in the White Sea would be frozen in during the winter.

As soon as I got news of this expedition I saw the Director-General, Sir John Goodwin, and volunteered as Surgeon to one of the Hospital-ships because I had been in the White Sea and knew Archangel. Sir John tried to frighten me somewhat in the terms of the telegram I received in Moscow in 1912. He said, 'My dear fellow, you will be landed at Murmansk and then take a long tedious journey on a reindeer-sledge through the forests and tundras of the Kola Peninsula where wolves abound, and finally over the ice to the ships in the Bay of Archangel'. He decided that I ought to be satisfied with my experience with the Convoy in the North Atlantic in 1917 (see p. 82).

AMUNDSEN AND THE SOUTH POLE

At the time public interest was stirred by two rival expeditions striving to reach the South Pole—an English Expedition under Captain Scott and a Norwegian Expedition under Raold Amundsen—I had an opportunity of visiting Iceland and Spitsbergen. The pilot was a Norwegian who spoke excellent English and I had many delightful talks with him; he knew Amundsen intimately. One morning while we were watching whalers at work among ice near King's Bay, Spitsbergen, our conversation turned on the race for the South Pole. The pilot expressed his confidence in Amundsen because, 'he has been in ice all his life'. The pilot's prescience was confirmed and, as all the world knows, Amundsen succeeded in planting the Norwegian flag at the South Pole one month before Captain Scott and his party, after a difficult and exhausting journey, reached the Pole to find he had been forestalled.

During the Great War Amundsen visited London, and a friend living at Stamford Hill asked me to meet him at dinner. I took the opportunity of acquiring inform-

ation on a point which perplexed me. I know, from experience gained in watching officers determining a ship's position at sea, that differences occur in the results of their observations. This must also apply in deciding the exact position of the Pole. With this idea in my mind I suggested to Amundsen that it was good luck, when Scott's party, on reaching the vicinity of the Pole, found the Norwegian flag and tent.

Amundsen explained to me he was aware that Scott was endeavouring to reach the Pole, therefore he decided not only to plant a flag at the calculated Pole, but took precautions to plant flags at various points radiating from the Pole, over a circle 20 kilometres in diameter; with the hope that at least one would be found.

It was recorded in Scott's journal that, two days before reaching the Pole, a black flag tied to a sledge-bearer (ski-sticks) was found, and Scott realized that he had been forestalled by the Norwegians. Two days later the English party reached Polheim—Amundsen's camp at the South Pole—and found the Polar Flag.

After an enjoyable evening at Stamford Hill we decided to return home, but London was enveloped in a dense fog. Amundsen was not deterred by fog, and the guests left in two motor-cars. Half-way home both cars and an omnibus were in collision. My car was crippled and left behind. We crowded into the remaining car and Amundsen insisted on acting as pilot and decided to follow tram-lines. We went along for some twenty minutes and the fog lifted. To our surprise we found ourselves near the scene of the accident. In some way the car had turned on its tracks. Of course there was much amusement among the party; we joked with Amundsen that his experience of Arctic and Antarctic fogs did not qualify him as a guide in a London fog!

CHAPTER VII

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

IN my spare time I paid occasional visits to the Hunterian Museum at the Royal College of Surgeons. As the years rolled on my interest in this Museum steadily increased. As soon as I began to attend the Prosectorium at the Zoo my knowledge of the work-rooms at the College became intimate. When a rare animal died in the Gardens Professor Flower, as President of the Zoological Society, had the choice of it for scientific purposes, or for the Museum. In such cases I followed it and took advantage of its dissection, and in this way got acquainted with that expert dissector William Pearson, who prepared the dissections of the human body which are so much admired and studied by medical students who use the Hunterian Museum. These dissections are unrivalled.

I was so impressed by Pearson's specimens that I made similar preparations for lecture purposes at the Middlesex Hospital Medical School; some of them are in excellent condition, and in almost daily use, although mounted more than forty years ago.

Frequent visits to the College work-rooms enabled me to become familiar with the technique of preparing, injecting, and mounting specimens. Nowhere in the world is the preparation of 'wet specimens' so well carried out as in the Royal College of Surgeons of England. It

has descended to this institution direct from John Hunter, who was supreme in this art. In an indirect way the Art came to the Middlesex Hospital School from the Windmill Street School through Sir Charles Bell (see p. 56).

Flower's energies in the Hunterian Museum had been devoted to Mammalian Osteology, Whales, Marsupials, Anthropology, and especially the brain and skull of Man, but he never entered heartily into the Darwinian controversy, although he was an intimate friend of Huxley. Flower was far too cautious to show his hand, but he did much to help Huxley in his contention with Owen over the brain and the hippocampus minor! This is cleverly satirized by Charles Kingsley in *Water Babies* (1863).

Professor Flower left the College of Surgeons in 1884 to become Director of the Natural History Museum, South Kensington. At the College he was succeeded by Charles Stewart as Conservator. Stewart had been Lecturer on Physiology at St. Thomas's Hospital Medical School; he was an expert in Marine Biology, especially hydrozoa, star-fishes, anemones, and ascidians; an excellent lecturer, and a clever draftsman. Stewart also had a profound knowledge of the semicircular canals of fishes. His interest in the ear-capsules of fishes led him to prepare for the Museum a series of dissections showing especially the semicircular canals and the lagena; and their relation to the swim-bladder. There is also a clever dissection displaying the Weberian ossicles in the fresh-water bream. Stewart died in 1907. He wrote little, but the third volume of the *Physiological Catalogue of the Museum* which he prepared is a splendid piece of work. Stewart told me that his interest in the semicircular canals in fishes arose in this way: as a boy he searched for otoliths among the pebbles on the beach, and acquired such an

intimate knowledge of them that he could tell the species of a fish from its otoliths and that led him to extend his studies to the labyrinth.

In 1890 I was too engrossed in Surgery to continue regular visits to the Prosectorium. My aim was Surgery. Many have asked me why I became a Surgeon instead of devoting my life to Science? I entered the profession determined to be a surgeon. Operative Surgery fascinated me. The persistent work in the dissecting-room was due to my firm belief that an intimate knowledge of Human Anatomy, normal and morbid, is a sure foundation on which to build success in Surgery. Morphology, Animal and Vegetable, sheds a clear light on many pathological problems and affords support to the Theory of Evolution. The preparation of three special lectures yearly for six successive years to be delivered to a critical audience demanded time and care as well as material. To lecture for an hour and keep the attention of the audience is not an easy task. I always had pity for students who, in order to get their schedules signed, were compelled to attend lectures by the hundred. In my student days the senior lecturers began at the hour and drivelled on until the clock struck the succeeding hour! I never followed this terribly dull habit, and shortened my first lecture at the College of Surgeons by fifteen minutes. A member of the Council, Mr. John Wood, explained to me that if I did not occupy the full hour the emolument would be shortened to correspond. I knew my second lecture would not last so long. To overcome this difficulty I arranged with a reliable attendant that he should sit in the gallery above the clock, and when the audience was intent on the lecture to advance the clock fifteen minutes. This device succeeded and as we filed out of the theatre Wood said to me, 'I'm glad you heeded my reproof.' No one noticed the trick!

PLATE V

EAR OF A NEWBORN CHILD

WITH AN UNUSUALLY BIG WOOLNER'S TIP

SIR JAMES PAGET

My connection with the College of Surgeons brought me for a time in contact with Sir James Paget. I had great admiration for him, and he took deep interest in my work. I delivered eighteen lectures *On Evolution and Disease* in the theatre of the College of Surgeons between 1886–91; Paget attended seventeen and apologized for the one he missed; he did much to encourage me in the pursuit of Comparative Pathology and considered it a useful mine—but, he added, *not a gold mine*!

I have a very happy recollection of dining with him in company with a dozen prominent members of the Pathological Society, of which he was at that time President. I sat next to him at dinner, and Norman Moore, who was near me, told a delightful story of Darwin. Moore had been visiting Darwin at Down professionally. On going into the study he found his patient sitting at the table contemplating a number of earthworms on an iron tray. Darwin was testing their sensitiveness to vibrations. The worms took no notice of the jingling of keys or the shrill note of a whistle, but when Frank Darwin played a tune on the bassoon immediately the worms began to wriggle.

PUCK: AND WOOLNER'S TIP

In Darwin's *Descent of Man* the first chapter is devoted to the consideration of the evidence of Man's descent from some lower form, and in dealing with rudiments, or as they are commonly called vestiges, we find the following passage:

'The celebrated sculptor, Mr. Woolner, informs me of one little peculiarity in the external ear, which he has often observed in men and women, and of which he perceived the full significance. His attention was first called to the subject whilst at work on his figure of Puck, which he had given pointed ears. He was thus led to examine ears of various monkeys,

and subsequently, more carefully, those of men. The peculiarity consists in a little blunt point, projecting from the inwardly folded margin, or helix.' (*Plate V.*)

Darwin, from a careful consideration of the facts, thought it probable 'that the points are vestiges of the tips of the formerly erect and pointed ears'. His views on this small 'point' led to a remarkable controversy, but all anatomists accept them to-day. I have a well-developed point on the helix of my right ear. Mrs. Woolner informed me that her husband made his observation at the age of 22; when engaged on a bust of Darwin he discussed this variation in the shape of ears with him. In a letter to Woolner (1871) Darwin wrote: 'The tips to the ears have become quite celebrated. One Reviewer (*Nature*) says they ought to be called, as I suggested in a joke, Angulus Woolnerianus. A great German Physiologist is very proud to find that he has tips well developed.'

The plaster model of Puck was exhibited at the British Institution in 1847. Woolner died 1892, and in the memoir written by his daughter,[1] I find this model referred to as 'a brilliant and animated statuette of Puck perched upon a toadstool, and with his toe rousing a frog'. (*Plate VI.*)

With loving care this model has been preserved by Mrs. Woolner. Anxious lest it should be damaged, she resisted for many years my request for a bronze cast; at last she consented and I became the proud possessor of a cast of this charming statuette.

In a letter, containing some interesting facts relating to Puck, Mrs. Woolner ends in this way: 'I hope you will find him a pleasant fellow to live with.' She also told me an amusing story which happened at Down. Her

[1] Amy Woolner, *Thomas Woolner, R.A., Sculptor and Poet: His Life in Letters.* 1917.

PUCK

From the Bronze Statue by Woolner

daughter Amy, then a little girl, was walking in the garden with Darwin, and he asked her if she would like a rose and stepping on the flower-bed plucked one and gave it to her. She shyly thanked him and said, 'Oh! Mr. Darwin, how could you dare to pluck a rose without asking the gardener's permission?'

Happily Down House and grounds, through Mr. Buckston Browne's enthusiasm for the great naturalist, have been preserved for the Nation. Surely it was irony of fate that caused this house, where Charles Darwin wrote the *Origin of Species*, which in 1859 astonished Zoologists and inflamed the Church, to become a school for children. Some years ago Miss Willet Ram conducted me over the house and grounds. It is to her credit that she respected Darwin, preserved his study safely, and kept the famous 'sand-walk' in good condition.

It was a lovely afternoon when my wife accompanied me round the 'sand-walk'. I plucked some primroses and pointed out to her the significance of the 'pin-eyed and thrum-eyed' flowers, which Darwin described in a paper to the Linnean Society. He was unable to be present when the paper was read. Sir Joseph Hooker was at the meeting and subsequently described to Darwin at Down the reception of the paper: an enthusiastic admirer of Darwin got up, made some remarks, and in concluding likened British botanists, who had overlooked such a beautiful contrivance to effect cross-fertilization, to Wordsworth's 'Peter Bell' because:

> 'A primrose by a river's brim
> A yellow primrose was to him,
> And it was nothing more.'

Darwin roared with laughter and said, 'I would rather be the man who thought of that on the spur of the moment than have written the paper that suggested it.'

A VALLEY OF DRIED BONES

Ezekiel's vision of the valley of dried bones has always had a curious attraction for me. I never enter the Western Gallery of the Hunterian Museum without thinking of it. This wonderful gallery contains a splendid collection of mammalian skeletons ranging from mice to sperm-whales, neatly and correctly articulated. In addition it contains not only skeletons of mammals which live on the globe to-day, but the bones of antediluvian monsters such as Ezekiel never imagined.

Among the skeletons of extinct mammals which Darwin collected in South America during the voyage of the *Beagle*—Mylodon, Megatherium, Glyptodon—there is the skull of an animal known as Toxodon, and of this Darwin gives a delightful account in the *Voyage of the 'Beagle'*: In 1883 he was on the Pampas (Uruguay) and heard of some giant's bones at a farm-house on the Sarandis, a small stream entering the Rio Negro. He went to the place and purchased, for eighteenpence, a skull. When first found it was quite perfect, but the boys knocked out some of its teeth with stones and then set up the 'head as a mark to throw stones at'.

Many miles from the place he found a tooth which fitted one of the sockets in the skull. It is now known that the teeth peculiar to this animal are curved like a bow. In consequence it was called Toxodon. This skull which Darwin purchased so cheaply is now preserved in the Hunterian Museum. He also obtained fragments of the skeletons of strange animals—stranger even than Job's Behemoth!

Darwin concludes that 'the whole area of the Pampas is one wide sepulchre of extinct quadrupeds'—Indeed, a valley of dried bones. The simple style of Darwin's writings is charming; he rarely indulges in rhetoric, but

when describing the flight of a swarm of locusts he borrows this simile, 'and the sound of their wings was as the sound of chariots of many horses running to battle'—then follows his own simple metaphor—like a strong breeze passing through the rigging of a ship.

Every Curator of the Hunterian Museum, from the time it was entrusted to the College, has done his best to add 'bones' to the collection. Indeed, it may be said—skulls grin on every side.

Sir Arthur Keith, the present Conservator, has eclipsed his predecessors in adding skulls of apes and Prehistoric Man. On one occasion, as President, I mildly remonstrated with him for using the kitchen as a temporary ossuary for some human skeletons which had been disinterred from an old Roman burying-ground near Scarborough. About that time I returned from a journey in Portugal, where I followed the track of John Hunter during his service with the Army near the end of the Seven Years War (see p. 115).

On this trip I spent a day at Evora, where there is an old conventual church, São Francisco. A chapel adjoins the church—Casa dos Ossos—the walls of which are covered with human bones. It is in fact an ossuary. Over the entrance to the chapel is this inscription:

'Nōs, ossos, qui aqui estamos, pelos vossos esperamos.'
The bones that lie here wait for yours to appear.

The same inscription would fit the Hunterian Galleries.

Like many naturalists I am interested in the blind fishes, crayfishes, and insects which live in the Mammoth Caves of Kentucky. Darwin specially mentions them in the *Origin of Species* as examples of the disappearance of organs from disuse. 'In some of the crabs the footstalk for the eye remains, though the eye is gone; the

stand for the telescope is there, though the telescope with its glasses is lost.'

In 1926 I attended the International Symposium on Cancer Control held at Lake Mohonk, New York, and being within 800 miles of the Mammoth Caves I took the opportunity of visiting them. The visit was also stimulated by the agitation in the States of Kentucky and Tennessee against teaching evolution. This was more remarkable as in the State of Kentucky there exists such a good example of altered environment leading to disuse and consequent loss of the eyes of the creatures living in the Caves, and a compensatory increase of sensitivity in the organs of touch.

The caves are of enormous extent and have been explored for more than 100 miles. Profound darkness and stillness reign in this underground labyrinth. A remarkable feature of the Caves is Echo River, 260 feet underground; it is a sluggish current 20 feet wide and about half a mile long, liable to sudden influxes of water, and its level may rise as much as 5 feet in an hour. The water escapes under a bluff into the Green River, a tributary of the Ohio. Echo River is the home of the blind crayfish *Cambarus pellucidus*. I was successful in obtaining, with the aid of a guide, and the help of Mr. G. B. Ewing, a medical student of the Vanderbilt University, Nashville, some crayfishes. I failed in keeping them alive, and had to be content with preserving them for the Museum. The crayfishes, though blind, are very active; they are translucent, devoid of pigment and eyes, but they have long slender antennæ and are sensitive to light and easily disturbed by slight motion of the water. Their sense of touch appears to be very acute. They feed on aquatic crustacea which they deftly extract with pincer-like claws from under stones. The intestines contain mainly mud and vegetable fibre. Alive the crayfishes

are so translucent that one fears to touch them for fear the appendages should break. When caught in the hand they struggle violently and without damage to themselves.

I discussed the question of Evolution with the guide, and asked him, How, with such an excellent example of the inherited effects of disuse daily under his eyes, he could doubt the Theory of Evolution? This was his reply: 'Oh! Yes, I believe it in regard to the creatures living in the Caves, but not otherwise.' Mentally he was as blind as the fishes.

Blind translucent crayfish and unlucky,
How did you lose the precious sense of sight
In the dark Mammoth Caves of Kentucky?

If I could only find the solution
It would shed welcome and refreshing light
On much that is dark in Evolution.

VIRCHOW AND HUMAN TAILS

The world at large displays an interest in human beings with tails, and this became significant when Darwin made it clear that Man has descended from tailed ancestors. Virchow made an important contribution to this question in 1884, entitled *Schwanzbildung beim Menschen*, to the Medical Society, Berlin. It was a useful summary and his conclusion is this: Man has rudiments of a tail at the end of his spine. With this statement anatomists agree. It is also true that a tail is represented in some new-born children by a soft appendage which resembles a pig's tail; but no one has reported an example of a human tail containing bony elements.

I had difficulty in obtaining in London a copy of the paper containing these observations. I met Virchow when he attended the International Conference, 1881. He came to the Middlesex Hospital and I had the pleasure of showing him the Cancer Wards. Some years

later when I wanted to use his observations on *Human Tails*, I wrote and asked for a copy and to my pleasant surprise received a Separat-Abdruck by return of post. The prompt reply impressed me. I have noticed that Great Masters are always ready and willing to aid young earnest workers. Virchow's writings on Pathology were of the utmost value to me, especially his big book on Tumours-Diseases which is crammed with a multitude of facts, but it remained incomplete. New discoveries on the intimate relation of micro-organisms to disease laid a mine which destroyed existing theories on the Nature of Tumours.

Gegenbaur, Professor of Anatomy at Heidelberg, wrote an autobiography under the curious title *Erleben und Streben*, in which he refers to Rudolph Virchow when he retired from Berlin to Wurzburg, in 1848, on account of his revolutionary political ideas. Gegenbaur was in Wurzburg at the time and attended Virchow's lectures with advantage, although it was not easy, even with close attention, to follow them. It was said he lectured unprepared. Gegenbaur recognized the importance of Comparative Anatomy in studying the descent of Man; also the value of Embryology in relation to the classification of Tumours (see p. 196).

PASTEUR

When I entered the Middlesex Hospital in 1878 two subjects were absorbing the attention of the civilized world, Bacteriology and Antisepsis. One associated with Pasteur, the other with Lister.

I saw Pasteur in 1888 when he was engaged with Hydrophobia. Sir James Paget gave me an introduction, and Pasteur allowed me to visit the laboratory and note the experimental tests on rabbits, and the preparation of the injection material from the spinal cord.

The Reception Hall for patients offered a wonderful scene. It contained a cosmopolitan crowd of patients from all countries of Europe. These patients—men, women and children—had been bitten by rabid dogs, and dogs supposed to be rabid. Some mujiks from Russia were among the crowd; they had been bitten by wolves. The patients stood in line, each with an area of the abdomen exposed ready to receive an inoculation. I had not appreciated the fact that bites from rabid animals such as wolves and foxes were so frequent.

The crowd of patients, young and old, rich and poor, big and small—the Russian peasants from Smolensk towered like giants among the crowd—was an impressive indication of the fear human beings have of hydrophobia, and their extraordinary faith in Pasteur's remedy.

Baedeker's *Guide to Paris*, 1900, in referring to the Pasteur Institute in the Rue Dutot, contains this significant information:

> Patients are treated for hydrophobia daily after 10.30 a.m. on simple application.

Pasteur died 1895. In 1902 I visited his shrine with my wife. We admired Truffot's fine statue in front of the Institute representing the shepherd-boy Jupille struggling with a mad dog. He was the second patient inoculated by Pasteur for the cure of Hydrophobia. This boy, aged 14, was trying to drive away a mad dog from some children. Although he knew the dog was mad, he bravely struggled with it and with the help of his little brother, tied up the dog's mouth with his whip. He then stunned the dog with his sabot, dragged it to a stream and drowned it. While struggling with the dog he was bitten in both hands.

The dog's carcass was examined by veterinary surgeons and they decided the dog was rabid. Jupille was treated

by Pasteur and recovered. The savant was so pleased with this brave boy that he found a place for him in the service of the Institute.

Jupille was the model for the statue (*Plate VII*) which stands in front of the Institute, representing the shepherd-boy endeavouring to tie up the mouth of the dog with his whip. The sabot is also in evidence.

When I visited the Institute in 1902 Jupille was the concierge. Surely never in the history of the world has a concierge had his counterfeit presentment in front of his conciergie! I asked Jupille if it were possible to obtain a copy of the statue. We entered the conciergie and on *la cheminée* there was a copy, very dusty—but exquisite. Jupille explained that he needed money. There was some inconsequent talk about francs; the bronze became my property, and remains for me a source of pleasure henceforth.

LISTER

In 1886, when Lister treated a compound fracture of the leg in Glasgow Infirmary with crude carbolic acid, I was in my eleventh year. Thirteen years later I was studying Surgery under J. W. Hulke in the Middlesex Hospital, and becoming initiated in Lister's method of Antisepsis, I took my turn in working the carbolic spray when operation wounds were dressed. At this date Lister was Professor of Clinical Surgery at King's College Hospital, London. The attitude of the Surgeons of the Middlesex Hospital to Listerism is described on page 33.

In 1886 antiseptic methods had gained ground in London, but the carbolic spray was regarded as an abomination. At this date I was Assistant-Surgeon to the Middlesex Hospital and did not use the spray for my patients. When Koch introduced corrosive subli-

JUPILLE, THE SHEPHERD BOY

From the Bronze Statue by Truffot

mate as an antiseptic I used it with great advantage, for skin in the wound area; as a dressing, and for disinfecting our hands. Lister clung to carbolic acid with amazing tenacity. Queen Victoria died in 1901; and a meeting of Fellows of the Royal Medico-Chirurgical Society, London, with Sir James Paget in the Chair, was convened for the purpose of moving a 'Loyal address to King Edward VII'. I was present and heard Lister move the Address, in the course of which he referred to an operation on the Queen in this way: I believe that I happen to be the only person who ever exercised upon her sacred body the divine art of surgery!

There is a story about the spray, told me by one who was present at the operation on Queen Victoria, which is worth mention: Lister merely opened an abscess in her arm-pit in 1871. At each dressing the spray was used. On one occasion Sir William Jenner was entrusted to 'work the bellows' and he puffed the pungent vapour into the patient's face! Her Majesty complained and asked, 'Is it necessary?'

Sprays—hand and steam—are now preserved in museums of ancient surgical apparatus.

Lister regretfully discarded the spray in 1887. At the time he was developing Antisepsis, surgeons in Edinburgh, Birmingham, and London were improving the results of ovariotomy by simple means. At that date (1880) the methods for the removal of ovarian and uterine tumours were extremely clumsy and the mortality high. Attempts were made by a few of Lister's adherents to improve the results by adopting strict antiseptic precautions, including the spray. They were unsuccessful because carbolic acid introduced into the peritoneal cavity poisoned the patients.

Lawson Tait of Birmingham, and Bantock in London, discarded antiseptics and used plain boiled water with

great success. They were expert operators. The greatest improvements followed the use of antiseptics merely for the skin of the patient, instruments, and the hands of the surgeon and his assistants. Plain boiled water for the sponges. Gradually the dangerous marine sponges were abolished. Corrosive sublimate soon displaced carbolic acid solution for the hands. The greatest step of all was the plan of sterilizing by heat, instruments, ligature and suture material; all persons associated with an operation thoroughly disinfect their hands and wear sterilized rubber-gloves. This is known as the Aseptic method.

Looking backward many, like Lord Balfour, are profoundly puzzled by the reception which Lister's discovery received from his colleagues in the medical profession. This is in some measure due to the dislike surgeons have of submitting their patients to the risks of new methods. Sir James Paget expressed another aspect: As men grow old and wish for rest, they dislike the changes which come of the increase of knowledge.

PERSONAL RECOLLECTIONS

In the last twenty-five years of Lister's life I saw him frequently. He used 15 Fitzroy Square as a private Nursing-Home. I used Fitzroy House next door, established in 1877 with the object of serving as a Middle-Class Hospital for Paying Patients; it was the first private Nursing-Home in London, and is to-day a flourishing institution (1930).

Lister lived at 12 Park Crescent, at the top of Portland Place. His house was half a mile from the Gardens of the Botanical Society in Regent's Park. He used the Gardens much as he used Woodside Park in Glasgow as his 'Academia'. Lister was fond of Botany in the Linnean, not in the Darwinian sense. In fine weather he

wandered in the Students' Garden, where British wild flowers are arranged in beds according to their families and each species is duly labelled. The gardener in charge of these beds had an excellent knowledge of wild flowers, and he told me that Lister was keen to detect a plant in an improper bed!

One of the difficulties in managing such plots was explained to me by the gardener: It often happens that a plant springs up wild in a plot remote from the plot designed for it! This spontaneity on the part of the plant shows that its seeds find suitable soil in spite of the conceit of the gardener and the learning of the botanist. Lister, a great man in some things, simple in other matters, took delight in drawing the gardener's attention to such irrepressible plants!

Lady Lister died in 1893, and for the rest of his life Lister was a lonely man. He spent a summer in Sussex, and my friend, Dr. C. Fazan of Wadhurst, visited him occasionally or, as we say in practice—'kept an eye on him'. Lister complained to Fazan that when he took a drive in the landau the coachman had the advantage, for he could look over the hedges, his own view of the fields and flowers was obscured by the trees and hedgerows. He was also obsessed with the notion that the younger surgeons mocked at Antisepsis and were giving credit that belonged to it to the modern method—Aseptic Surgery.

Lord Lister died in 1912, and a monument to his memory stands in Portland Place, London, near the house where he lived, and practised. It was unveiled 13 March 1924. This duty devolved on me at short notice in consequence of the absence, through illness, of Sir Charles Sherrington, President of the Royal Society. It was a bitter cold day and as the weather did not favour speech-making I contented myself with these remarks:

'This memorial has been raised to the memory of a great surgeon, Lord Lister, who by his discoveries in science, his devotion to surgery, united Surgery and Science, raised the Art he practised, and launched it on the most wonderful era in its history. It is an honour to unveil this monument as a memorial of a genius who did so much to unveil the secrets of nature, and taught surgeons safe methods for relieving men, women, and children, from the dread consequences of septic infection. Veterinary surgeons apply the same principles when performing operations, for relief of physical suffering on horses, cattle, cats, and dogs. Lord Lister had the rare advantage of seeing his principles adopted by surgeons throughout the world. His influence will remain as long as surgery is practised as an Art, and the principles he discovered will remain as a blessing on every race of mankind. He was inflexible in the pursuit of truth and may be described as patience personified.'

As I pulled the cord, the drapery slipped down—suddenly a glorious flash of sunlight broke through a rift in the clouds and shone on the monument.

CHAPTER VIII

THE COUNCIL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

IN 1910 I was elected on the Council of the Royal College of Surgeons and in 1921 nominated Hunterian Orator. To complete my study of John Hunter's Life, I visited Portugal, in order to obtain first-hand knowledge of the Alemtejo which made such a remarkable impression on his mind.

Hunter's prime object in going to Portugal was to serve as a military surgeon. In 1762 England decided to support Portugal towards the end of the Seven Years War, when France and Spain attempted to invade Portugal by advancing on Lisbon along the Tagus. The British and Portuguese forces assembled on the banks of the Tagus near the Spanish border. Hunter, transferred from Belleisle to Portugal, had charge of a hospital at Portalegre. This town stands on a remarkable plateau called Alemtejo; it is 142 miles from Lisbon. I went to Lisbon and made the journey to Portalegre by car along the right bank of the Tagus to Abrantes, crossing the river by the bridge. After travelling along a rough and almost obliterated track, we found a good diligence road, and lighted only by the stars, reached Portalegre near midnight. My party consisted of myself and my wife, chauffeur, mechanic, and a guide. We had to be content with a miserable dirty hotel; our supper consisted of cabbage soup, stale bread and some weak coffee. I

spied a bottle of crème-de-menthe on a shelf and this was welcome. There was one other guest, but he was sitting at the table quite drunk and had been drinking the liquor. We learnt to our surprise that he was the local doctor. The sleeping-room contained two loose bags of hay which served as beds and we used our rugs as coverlets. There was no fastening to the door. Our guide became our guard and slept curled up on the floor outside the door. The lavatory was a filthy recess on the landing free to all—men and women.

I arose early in the morning and walked around the town. Portalegre is like an Eastern City. It has a Cathedral and a bishop, a ruined Moorish Citadel and a well-preserved Moorish Palace. A herd of pigs scavenge the street early in the morning and gobble up vegetable remains—cabbage leaves, banana skins, apple parings, orange peel, fragments of bread, and the like. I failed to find any traces of the British occupation of the town or any evidence of the almost forgotten expedition.

At Portalegre Hunter had few opportunities of increasing his experience of military surgery, but he extended his knowledge of Natural History and Geology. When he went to Portugal it was believed in England that swallows became torpid in Winter 'as the bear, dormouse, lizards, snakes and some other creatures do'. At Portalegre he satisfied himself that swallows migrated. At that time there were persons in England who believed that some migratory birds, including swallows, left the atmosphere of the Earth for that of the Moon!

Hunter had leisure to make a thorough investigation of the Alemtejo and this led him to write a tract, entitled *Observations and Reflexions on Geology*, in which he described the remarkable pyramidal heaps of huge stones, so frequent on this plain, and also discusses their probable origin. Reflecting on his observations, he concludes that

this large tract of land shows signs of its surface having been covered by the sea!

This experience so influenced his mind, especially in regard to the Age of the World, that he wrote a Tract which contained ideas on the Distribution of Animals inconsistent with the description of the Creation in Genesis. These views expressed in this Tract disturbed his friends, and on their advice he abstained from publishing it. The Tract was discovered fifty years after his death.

The Alemtejo, even in December, is a delightful plain; there were many flowers at the time of my visit—gorse, heath, cistus and wild roses—bright blue gentians peered at the sun from among the dry stems of the cistus bushes. The landscape is varied with forests of evergreen oaks and cork-oaks, and stacks of cork are as common as hayricks in rural England. The politeness of the Alemtejan peasant is delightful; men, women, and children are kind to animals.

At Estoril, a few miles from Lisbon, Aubrey F. G. Bell gave us useful help. He has written an excellent book on *Portugal and the Portuguese* containing an extract from a sixteenth-century play, by Gil Vicente, which shows that the Lusitanian peasants are as hard to please as farmers in less-favoured countries. A peasant complains to the priest that God has a spite against him, and rails in these terms:

'God sends rain when I don't want it, and when I would have some rain the very stars shine like the sun. Now He swamps the newly-sown fields, or parches everything, or sends cruel wind or snow to kill the flocks, and if I would sue Him for damage done by lightning or thunder hail, or frost, who is to find out His dwelling to summon Him? He cares for no one and will do as He likes. But in spite, without a farthing to gain from it, sends rain in January and frost in April, and summer heat in February, mist in the months of May, and hail in mid-July.'

We returned to Lisbon from Portalegre by way of Estremoz; and at Evora visited the old conventual church

São Francisco and its curious Ossuary (p. 105). On returning to Lisbon we found the city disturbed and hourly expecting a revolution. Next day we were relieved to see the S.S. *Andes* in the Tagus. Our embarkation was delayed while a gun-battery and mules were landed at the quay. In the afternoon we got on board, glad to leave Lisbon.

On our voyage home Lord Riddell joined the ship at Vigo and we landed at Southampton. On the journey we discussed matters concerning Natural History, and this induced Lord Riddell to ask me to deliver an Address to the Portsmouth Brotherhood, a Society in which he was interested.

The Brotherhood meets on Sunday afternoons, and a lecture is delivered on a literary or a scientific subject by a recognized person. The Lecturer may choose any subject. After thinking the matter over and obtaining a prospectus of the Brotherhood I promised to deliver a lecture and selected a subject which had interested me from childhood—the Nuptial Livery of Fishes and Birds (see p. 7). The date was arranged with the secretary and with an intimation that I should require to hang a dozen large diagrams.

On the Sunday fixed for the lecture I arrived at Portsmouth and was delighted to be met by my friend Charles P. Childe, Surgeon to the Royal Portsmouth Hospital: he was the Chairman. We lunched together and proceeded to the meeting-room. My astonishment was great to find myself in a large Chapel overflowing with men responding to prayers and singing hymns, led from the pulpit. Turning to Mr. Childe, I said: If I deliver my Address on Nuptial Livery in this place, I shall be pelted by the congregation! He replied, You may talk on any subject you think fit. My diagrams, I asked, How could they be displayed?

PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND, 1925

From the Painting by the Hon. John Collier in the Hall of the Royal College of Surgeons of England

When delivering lectures in strange places, I take a ball of thick cord and drawing-pins. On this occasion the difficulty was overcome by stretching a strong cord from one gallery to the gallery opposite and the big diagrams were fastened to the cord; the smaller were fixed on the pulpit with drawing-pins. Hymns were lustily sung during these preparations, and when all was ready I ascended the pulpit and described how the male of some fishes blaze in resplendent colours at the spawning season; and the males of many birds develop remarkable feathers, extremely brilliant in colour, and perform antics, in which the bright-coloured feathers play a part, in order to fascinate the hens.

I never addressed a more attentive audience.

In 1923 I was elected President of the Royal College of Surgeons (*Plate VIII*), an office which some surgeons regard as a prize, others as a penalty! I considered it a prize. The duties of President were congenial and during the three years of my Presidency I received some honorary degrees. In 1923 I was created LL.D. of St. Andrews, the year in which Rudyard Kipling became Rector. In the preceding year he was seriously ill and an operation was required. He was under my care in London and, when able to carry out Rectorial duties, recommended me for a Doctor of Laws degree. This was conferred by Earl Haig. Each doctor is dubbed with a piece of folded cloth which was formerly part of the seat of John Knox's breeches! The Prime Minister, Mr. Stanley Baldwin, among others received the degree on that occasion. The undergraduates were as noisy as ever, especially the female undergraduates and they insisted on a speech from each Honorary Graduate.

This was unexpected, and as I was last on the list there was time for me to collect my thoughts. I was informed that it is rare for the LL.D. to be conferred on men South

of the Tweed, and taking advantage of this information, replied in the following terms: I know medical students so well that to-night, when I lie half-asleep and fancy myself listening to undergraduates at a smoking concert, some one will sing a topical song with a verse in it something like this:

We all work hard at St. Andrews, N.B.,
And pay our cash for a single M.D.
The man from the South is double L.D.
This we agree is all fiddle D.D.

The University of Glasgow conferred an LL.D. upon me on the occasion of unveiling the monument to William and John Hunter in the University Grounds, 24 June 1925. This function was noteworthy, because on the same day Paderewski—patriot, pianist, and composer—also received a degree. After the ceremony Paderewski roused the enthusiasm of the undergraduates to a high pitch by his extraordinary pianoforte playing in the Common Room. The whole ceremony will on this account remain memorable in the history of the University.

I had to make a speech at the unveiling, of which the following is the substance:

'It is by a happy concatenation of circumstances that I should receive an honorary degree, as President of the Royal College of Surgeons of England, at the moment the University of Glasgow is engaged in unveiling a Memorial to two great Scotsmen—William and John Hunter. The brothers so opposite in character, yet agreed in two important particulars—their devotion to Anatomy and their interest in Museums. Glasgow accepted William's Museum and his money. The Royal College of Surgeons of England became Trustees of John Hunter's Museum, no money, but huge responsibilities.

William Hunter's interest in teaching was great. He was actuated by this sound principle—a man may do infinitely more good by teaching his art than by practising it. William, in spite of this idea, made much money by practice. He was Physician-Extraordinary to Queen Charlotte and accumulated a fortune. The Arms of our College are finely represented on the Memorial, and the supporters are two famous sons of Æsculapius—Machaon and Podalirius. They served in the Trojan War. Podalirius, returning from the War, was wrecked at Caria. He had the good fortune to cure a princess of falling sickness (probably hysteria, for he was a good-looking fellow) and attained a great reputation thereby. At his death he was accorded divine honours, and a temple was erected to his memory. Podalirius could recognize what was not visible to the eye and tended such diseases as could not be healed. He was obviously a physician. Machaon was a surgeon. Paris wounded him in the shoulder with an arrow. This caused great consternation among the Commanders—

> "And yet Machaon wounded in his tent,
> Now wants the succour he so often lent."

Patroclus removed the head of the arrow; washed the wound; infused a styptic, and closed the wound to stop the bleeding. Could Lord Lister have done better? The comparison is simple—William Hunter, the physician, pleased a Queen; made a fortune; left a wonderful Museum, and money to Glasgow. John Hunter, a military surgeon, left a Museum in London, and no money, but received wonderful posthumous homage. He recalls Machaon. What could two famous Scotsmen desire more than to be as immortal as Podalirius and Machaon.'

The social duties of the President are many and various.

Most of them are agreeable, a few irksome, and some sad. Invitations to the Livery Dinners of the City Companies are frequent. Some of the Halls are ancient and historically interesting. A few beautiful. The dinners are, as a rule, good; the wines satisfactory; the customs quaint, and the after-dinner speeches variable in quality and in length.

The President is usually invited to the Banquet at the Guildhall on Lord Mayor's Day. This is always an important function, especially the reception of the Lord Mayor's Guests. Statesmen, Sailors, Soldiers, Legal Luminaries, Bishops, Physicians, Surgeons, ex-Lord Mayors, Sheriffs, Aldermen, and Councillors. Gog and Magog watch the banquet in dignified silence.

Dinners at the Inns-of-Court are interesting; the Judges and Lawyers, men of mark; at these dinners there is a long Grace, usually gabbled; no speeches, but plenty of chatter whilst the dinner is gobbled! Some of the customs are old and therefore quaint. The wines are old and good, some indeed—especially port—excellent.

Their Majesties the King and Queen opened the New House of the British Medical Association, 13 July 1925. At that date I was President of the Royal College of Surgeons, and at Lord Dawson's suggestion I showed their Majesties some rare and curious things from the Hunterian Museum. The specimens comprised some shrunk heads of Indians from the dense forests of the Amazon Region; the conjoined skulls of a two-headed child; the heart of a calf pierced by thorns and twigs of witch-hazel —an example of sympathetic magic; an immense hair-bun from the stomach of an alligator, and a stuffed hen Japanese pheasant which had assumed the plumage of the cock! King George was interested in this pheasant and fortunately I knew its history:

In 1886 the Rev. Dr. Bourne, who was connected with Salisbury Cathedral, kept pheasants as a hobby, and invited me to lunch with him and look at a Japanese hen pheasant which had assumed the beautiful metallic plumage of the cock. During lunch Dr. Bourne ate little, but amused himself rolling bread-pills, which he collected in a saucer. When we visited the pheasants after lunch he used bread-pills to entice his pet into the open. The bird was adult when Dr. Bourne obtained it in 1881, and in its early years at Salisbury laid eggs freely. Later her eggs were infertile. In 1891 she ceased to lay and assumed male plumage, which improved with each moult. I begged that when the bird died, it should be sent to the College Museum. This pheasant died during a severe frost in February 1895, and was sent to me. Professor Charles Stewart, the Conservator of the Hunterian Museum, was delighted with the bird, especially as I had obtained its history; he had its skin stuffed and placed in the gallery of the Museum.

When King George saw it he at once exclaimed: 'A mule-pheasant! Ah! I had a more remarkable example in a Golden Pheasant, for the change only affected one side of the bird.'

The exquisite beauty of the feathers of birds when alive in a great measure fades when they die; this is especially true when the colour is due to transmitted light —metallic colour—and not to pigment.

A bird with brilliant plumage due to metallic coloration is a beautiful object when flying in the sun. No one can realize the splendour of a Japanese pheasant from a stuffed skin. I have given close attention for many years to the curious sex-changes in hens. No satisfactory explanation has yet been offered. Careful thought on such matters leads me to this opinion: *We are grossly ignorant of the factors of animal evolution.*

The exhibit in which the Queen showed most interest was one which my friend S. G. Shattock considered the most wonderful specimen in the College Museum;—the conjoined skulls of a two-headed Bengalee boy. When the boy was born, the midwife, terrified at the appearance of the additional head, threw him on the fire. He was rescued and used for show purposes. When this two-headed child was four years old, the mother left him in a tent while she fetched some water; during her absence he was bitten by a cobra and died. The Queen exclaimed, 'Poor little thing!' I replied, 'Probably a cobra never used its venom for a better purpose'. The Queen turned and looked at the Archbishop of Canterbury who was by her side—both quietly smiled.

The President is often invited to the Annual Dinners of Medical Schools, and when he attends he is, as a rule, treated as the principal guest.

In 1926 I distributed the prizes at St. Thomas's Hospital School, and took advantage of amusing myself by making some remarks on Medals.

MEDALS

Students are interested in Medals—gold, silver or bronze. A medal is a piece of metal, of no use in currency, struck to commemorate some person or event. This has been wittily called metallic memory. Some medals are beautiful objects of intrinsic value, as well as being imaginative and inspiring in design. Such an august body as the Council of the Royal Society awards several medals annually. Although some of these medals are associated with such famous names as Rumford, Davy, and Darwin, the Council has been led by experience to this conclusion: 'It is neither to the advantage of the Society, nor in the interests of the advancement of Natural Knowledge, that this already long list of

medals should in future be added to, and that, therefore, no further bequests to be awarded as prizes for past achievements, should be accepted by the Society.'

In times past some of the recipients, being impecunious —not an uncommon condition of scientists—sold their gold medals. A Royal Medal is supposed to contain fifty pounds' worth of gold. Macaulay, when hard up, sold his Cambridge Medal. T. W. Huxley, when in similar straits, and anxious to help a sick relative, realized his Royal Medal.

In 1880 I won the Murray Gold Medal for clinical proficiency. Some years later I heard a sermon on *The Parable of the Pounds*, and became thoroughly convinced of the folly of hoarding a gold medal. I took my medal to a goldsmith, but he cut it in twain, for said he to me, 'These medals often contain a core of lead'. The medal was divided and lo! in the midst of it there was a flat leaden disc, which reduced the value of the medal one half. Now I understand Dryden's satirical lines on medals:

> Golden to the sight,
> So base within, so counterfeit and light.

It is now the custom to have medals struck in silver or in bronze, and the difference in respect to gold given to the recipient in cash—a wise arrangement. The money is useful to students, as it enables them to wander abroad and ascertain what clever men are doing in other countries. It is good for medallists to realize that there are men as clever as themselves—this helps to rub off mental asperities and saves them from personal conceit.

The abolition of medals is not to be recommended, but they should be awarded with discretion. Medals serve as milestones in the history of institutions. Medallists, old and young, should bear this in mind: Medals are not

given for ostentation, but for remembrance as well as reward. They often bring to mind the names of the great men who laid the foundation of the advantages which the present generation of men enjoy, and it is the duty of those who come after to extend.

The President annually receives an invitation to the Royal Academy Banquet. This is one of the most popular functions of the year, and heralds the opening of the Galleries of the Academy, and the new pictures.

I enjoyed the function, and it fell to my lot to be entrusted with the toast of the Royal Academy and the health of the President—on this occasion, Sir Aston Webb. I spoke on Art and Anatomy. An hour later Sir Aston Webb had responded to the toast and was returning home in a motor-car in company with Sir Luke Fildes; both were very severely injured in a collision.

THE PRESIDENT'S ROBE

The robe which the President of the College wears in Council is made of black silk, with purple facings and kimono sleeves. The front of the gown and the sleeves are beset with silk tassels arranged in rows. In October 1925 Mr. George Belcher informed me that he had received instructions to supply some cartoons for *Punch*, would I be willing to sit for one as President of the Royal College of Surgeons? I agreed on condition that he represented me in the tassel-gown (*Plate IX*). This is the verse under the cartoon:

> 'Some surgeons cut you up like mutton
> But this is not the way with Sutton;
> Bland as his name, though stern of eye,
> He couldn't bear to hurt a fly.'

About a week after the cartoon was finished I met Sir Bernard Partridge, the Principal Cartoonist of *Punch*, at a

COLLEGE GOWN AND TASSELS

From the Drawing by George Belcher, R.A., in the Common Room of the Middlesex Hospital Medical School

charming dinner given by Dame Madge Kendal. Partridge was pleased with the cartoon, and especially with the 'gown and tassels' because his father, Richard Partridge (formerly known to students as Dickie Partridge), was President of the College in 1866, and he had a portrait of him in the same gown. Richard Partridge (1805–73) was for many years Professor of Anatomy at King's College in the Strand. In 1862 he went to Spezzia to attend Garibaldi after he had been wounded in the ankle at the Battle of Aspromonte. Partridge was also Professor of Anatomy at the Royal Academy. A few days after the dinner I received a letter from Sir Bernard, which is interesting in regard to his father:

'MCMXXV
'Dec: XIV

'I am always interested in news of my father: my recollections of him are so remote—only those of a child—and yet I quite worshipped him. Those who knew him are nearly all gone.

'Did you ever hear of his neat remark to Sir James Paget? My father had two extraordinary ill-assorted steeds in his carriage,—a little round animal like a hunting-cob, named Bobby, and a great long raw-boned animal named Garry (after Garibaldi). I remember both horses well, very odd they looked together drawing the brougham. One day Paget and my father were coming out from a consultation together and Paget, noticing the equipage, said, "Good Lord, Partridge, what a pair! Look at that great lanky brute!" "Yes," said my father, "I call him *longissimus dorsi*." "And the other one?" asked Paget. "Oh! he's just—*os innominatum*." '

The demands on the President's time are many and various, and leave him little leisure. Much of the work

is interesting and instructive and at the end of his term of office he feels himself a wiser man.

My last council was on Thursday, 9 June 1927, and my last business was the ratification of some Standing Rules rendered necessary in consequence of the Supplemental Charter with which I was largely concerned. This Charter is officially known as 17 George V, 19 August 1926.

This Charter is a landmark in the history of the College because in addition to some changes in the Rules of the Court of Examiners, it gives Women Fellows the same privileges as Men Fellows. Now they are able to vote for the election of Members of Council; may be candidates for the Council, and eligible as Examiners, and for the Office of Vice-President and President.

In consequence of this change it was possible for H.R.H. Princess Mary, Countess of Harewood, to be elected an Honorary Fellow in January 1927 by my successor.

In the last Council I attended, the President, as is usual, uttered some eulogistic remarks. For these I thanked him, and reminded the Members of Council present that retirement came to all in turn:

> Our circuit round the room in rotation,
> Is like the Moon's orbit—an ellipse,
> And after attaining culmination,
> Each recedes in shadow—an eclipse.

In spite of this jeremiad, so far as the Council was concerned, my deep interest in the Museum was fostered by being elected a Trustee of the Hunterian Collection 1927.

Most Presidents receive during their term of office letters from men—rarely from women, offering their bodies for dissection. Many do this on account of some

physical deformity. Others, in order that their bodies may be useful for anatomical purposes. Occasionally the latter are impecunious, and without stating their age, ask, if their offer be accepted, for cash on account.

THE HABERDASHERY OF SUCCESS

In Dublin, 1928, the distinction, Master of Surgery *Honoris Causa*, was conferred on me, and Sir Robert Tate, Public Orator, in a Latin Oration summarized the deeds which rendered me worthy to wear the robe of the University. At dinner in the evening I was chosen to reply to the Toast of the Honorary Graduates and, in the course of the speech, I remarked that as the emblems with which I had been draped could be termed the Haberdashery of Success, it would not be amiss to venture on some remarks concerning clothes, in view of the fact that in 1704 Jonathan Swift indulged his fancy in this respect in the *Tale of a Tub*, but for a widely different purpose.

After Eve disregarded the prohibition of the Apple-tree a peculiar dislike to complete nakedness overcame civilized men and women. Clothes are necessary for protection against weather and for decency; moreover, in civilized communities they help men and women to be attractive to each other.

There are creatures which remain naked throughout life. Many such—frogs, fishes, and chameleons—have the power of changing the colour of their skin, and can adapt it to suit their surroundings. This habit enables them to catch their prey, protect themselves against enemies, and especially to fascinate the females of the species.

Animals the least likely to be accused of possessing minds, or vanity, are crabs! Some of their actions attributed to instinct are difficult to distinguish from some performed by Man with the aid of reason.

The spider-crab is an artist in disguises; it sticks seaweed and sponge on its shell in order to conceal itself from an arch enemy—the devil-fish. Clothes are useful for indicating distinctions of rank—and sex. The importance of clothes as an indication of sex is emphasized in a commandment issued by Moses:

The woman shall not wear that which pertaineth unto a man. Neither shall a man put on a woman's garment; for all that do so are an abomination unto the Lord thy God.

Universities in Great Britain and Ireland disregard this ordinance. Are not the College gowns worn by undergraduates and graduates the same for the female of the species as for the male?

In civilized countries it is a most important use of clothes that they serve as an indication of sex.

Balzac wrote a droll story illustrating this: Titian painted a wonderful picture of Adam and Eve in which they are represented attired in ignorance and caparisoned in Divine Grace—the costume of the period. This picture ultimately reached Paris. The Court talked so much about it that the little Francis and Margaret, children of the Dauphine, wished to see it. Their mother allowed them to see the picture, and stood watching, and listening to their prattle:

'Which of the two is Adam?' asked Francis, nudging his sister's elbow. She replied, 'You silly, to know that they would have to be dressed.'

Balzac adds, If you wish to hear pretty speeches of infancy you must beget children.

SCARECROWS

Although men scratch their heads when they receive bills for what are called 'creations' from dressmakers and milliners, they like to see their wives and daughters

AN AFRICAN FETISH-HUT OR SPIRIT SHELTER IN UGANDA

AT NIGHT A PIECE OF POTTERY SERVES FOR A DOOR

neatly apparelled. It is, however, sad when beautiful clothes find their way to a rag-shop, or worse. Clothes which have adorned a countess, a courtesan, or a courtier may be stuffed with hay, straw, or wool, and set up in 'a garden of cucumbers' or in an orchard, with the object of frightening birds.

> Birds do not fear a scarecrow,
> They mute on it with zest;
> No eye hath seen a scarecrow,
> Which did not seem a jest.

Scarecrows are remnants of an ancient superstition. Savages set up fetish huts in their corn-patches, not to frighten birds but to scare evil-spirits, and hail, from their crops. (*Plate X.*)

Birds perch on scarecrows with the same impudence they display to images of saints, prophets, and kings in the porch of a cathedral. In the Epistle of Jeremy we are warned that scarecrows, like idols, are not only impotent to protect but they are deluding to the imagination.

In recent years our ideas in regard to nudity have changed. When R. E. Pine, a well-known artist, went to America in 1783, among the paraphernalia of his art was a plaster-cast of Venus-de-Medici, which he kept enclosed in a box, it being the first nude statue which had been seen in America. I have been reminded that in Pine's day there were many Puritans in the States; although they had artistic tastes and showed a critical love of 'paintings, sculpture and all liberal arts', they would not in public gaze on a nude figure—even in plaster! (*Plate XI*).

The most pathetic appeal for clothes which has come under my notice was a life-size plaster-cast of the same goddess—Venus-de-Medici—poised outside a rag-and-

bone shop near the Middlesex Hospital. Plastered across her omphalos was a notice to this effect:

RAGS WANTED.

There is nothing in the Epistle of Jeremy to equal such irony—irony worthy of Dean Swift.

As I am spokesman for the honorary graduates, may I say that we differ from the rag-and-bone man's Venus in having our shoulders covered with the haberdashery of success, and our hearts are warm with gratitude to the Senate for the kind recognition accorded to us.

> Brimful of glee I cross'd the Irish Sea,
> Proud to receive an honorary degree;
> Master of Surgery I'm glad to be,
> In Dublin's famous University.

The reference in Jeremy's satire on idols recalls to mind Isaiah's denunciation of the worship of images—molten or graven—whether made by the smith with the help of tongs and coals, and fashioned with hammers; or by the carpenter with rule and line, plane and compass, out of trees—cedar, cypress, or oak.

Isaiah's satire contains a curious sentence in reference to the smith warming himself, and saith: Aha, I am warm, I have seen the fire.

There was a Vicar who attracted, by brilliant preaching based on curious texts, large congregations. On a cold Sunday morning, with much sloshy snow about, his devoted parishioners made their way to church, and sat in damp shoes and wet nether garments. In due course the Vicar ascended the pulpit and gazing on the congregation, most of them with blue cold noses, exclaimed—Aha, I am warm, I have seen the fire!

I had a delightful tour (1923) in the Island of Corsica and returned to Monte Carlo. During my stay on the

VENUS-DE-MEDICI

PLASTER CAST USED AS A DECOY FOR A RAG-AND-BONE SHOP

Riviera, and in company with a friend interested in Botany, I made an excursion on the hills behind the town. We found an old wall thickly covered with leaves of a plant known to English children as penny-pies, and to botanists as *Cotyledon umbilicus-Veneris*—the omphalos of Venus. Then arose a discussion—Did Venus possess such a scar? I argued that the Goddess of Beauty, Mistress of Graces, Mother of Love, and Patroness of Courtesans was as free from such blemish as Eve. Painters and sculptors in their representations of the famous goddess always give her an omphalos. What a pity! I prefer to think of Venus fulfilling the ideal of Anatole France—Symbol of that sweet invincible power through which all living things multiply themselves.

CHAPTER IX

THE ZOOLOGICAL GARDENS

IN 1881 Mr. Jonathan Hutchinson urged the Council of the Pathological Society of London to obtain permission for the systematic examination of the bodies of animals dying in the menagerie of the Zoological Society. Every facility was granted by the President, Sir William Flower. There was a convenient Prosectorium which was used by the Prosector for the investigation of the Anatomy of Animals dying in the menagerie, and the results of such work were embodied in papers read at the Scientific meetings of the Zoological Society, and published in its *Transactions and Proceedings*. Moreover, it was in the province of the Prosector to facilitate the distribution of material to anatomists, who were engaged in special investigations. This made the Prosectorium a resort for Zoologists, Explorers, Ornithologists, Field-naturalists, and Travellers from many parts of the globe.

I was appointed to make the pathological examinations and carried them out regularly, without emolument, for five years. The experience I gained in the Gardens and in its Prosectorium was not only invaluable, but it tinctured my life by enabling me to obtain first-hand knowledge of the morbid anatomy of vertebrate animals. At that time the Prosectorium was a busy place; A. H. Garrod had carried out some brilliant work on Avian Anatomy, and collected much useful material for studying the Osteology and Myology of birds with the idea of

B. MOLOCH'S CARICATURE OF THE AUTHOR. 1909

using bones and muscles as a basis for their classification. Two famous Comparative Anatomists had already made extensive investigations on these lines and for the same purpose: Sundeval of Stockholm and T. W. Huxley; each endeavoured independently to find a method of classifying birds other than that of using exclusively their external characters—feathers, beaks, and claws. Sundeval relied on muscles. Huxley hoped to find a solution of the problem in the structure of the skeleton, especially the skull and sternum. He astonished his audience at the Royal College of Surgeons, in 1866, with the phrase—Birds are modified Reptiles.

Garrod had collected much useful material and published valuable contributions on the arrangement of the muscles in the legs and wings of birds, using variations in their presence, disposition, and absence in the various groups, as a basis of classification. He died in 1879, at the early age of 33.

Garrod was succeeded by W. A. Forbes, who continued to prosecute Avian Anatomy on the lines of his friend. Forbes investigated the anatomy of the Oceanic Birds collected by the Challenger Expedition, and wrote an excellent monograph on the Petrels. He also wrote a biography of Garrod and collected his papers in an important volume. On completing this work he went on a Natural History Journey to West Africa, and unfortunately contracted dysentery at Stronga, a station 400 miles up the Niger, and died there 14 January 1883, in his twenty-eighth year.

During the absence of Forbes the prosectorial work was undertaken by W. F. R. Weldon of Oxford. He was primarily interested in Invertebrata and left me free to make full use of the Vertebrata which came to the Prosectorium. Garrod's studies on the Myology of Birds was so attractive to me, especially in regard to the

Nature of Ligaments, that I followed it in order to gain some light on the origin of the slings, loops, and pulleys, in the legs and wings of birds, and the arms and legs of beasts, as well as the flippers of whales, especially in relation to Man. It was to me a discovery of great interest that many ligaments and fibrous structures could be compelled to testify concerning Man's Mammalian Kinship and Descent. (*Plate XIII.*)

The results of my dissections were published in the *Journal of Anatomy and Physiology*, edited by Sir William Turner and Sir George Murray Humphry. They were epitomized and published in a little monograph entitled *Ligaments: their Nature and Morphology*, 1887, which ran through several editions. This book evoked criticisms from teachers of Anatomy, including Thomas Cooke. W. H. A. Jacobson of Guy's objected to it on this ground: mixing Morphology with Anatomy for medical students beguiled them from the serious study of such an important subject as Human Anatomy. This means metaphorically, that I induced them to play with the sweets instead of seriously partaking of the solids of the feast. However, Cooke repented and for a session attended my Fellowship class; he subsequently wrote me a charming letter to the effect that he had been seduced by Fairy Morphology. Apart from Cooke's confession, the popularity of my little book, among teachers and students, atoned for my lapse from anatomical virtue.

My studies in Morphology were carried out not only for its intrinsic interest, but especially for the light Morphology sheds on the principles underlying Darwin's theory of the Origin of Species.

The hours spent in the Prosectorium, and the able men I met there, exercised great influence on my life. I especially mention Sir William Flower; Philip L. Sclater, an able ornithologist; W. A. Forbes, keen on the anatomy

of birds; F. E. Beddard, who devoted close attention to Earthworms and their allies; Sir Harry Johnston, who discovered the Okapi; and W. F. R. Weldon, Linacre Professor of Human and Comparative Anatomy, Oxford.

I was also able to help Sir Frederick Treves, who wished to study what he facetiously called the bowels of Man and Mammals. We became close friends.

My friendship with Treves began in 1883. He was then Lecturer on Anatomy at the London Hospital, and wished to obtain anatomical material, so I introduced him to the Prosector, F. E. Beddard. Treves examined the viscera of mammals before I disturbed them in the interest of Pathology. He made clever water-colour sketches exhibiting the normal disposition and complicated arrangements of the small and large intestines from Marsupials to Man. As an example of his zeal in this particular quest it may be mentioned that a young rhinoceros died, and Treves had the carcass conveyed from the Zoo to Whitechapel in order to dissect it leisurely. He soon learned how quickly the remains of huge mammals become offensive, and how difficult and expensive it is to dispose of them. This taught me to appreciate the enthusiasm of men, like John Hunter, Struthers, Turner, and Flower for Zoological Science, who dissected such huge creatures as elephants and whales. Treves used the material he obtained at the Zoological Gardens for his Hunterian Lectures delivered at the Royal College of Surgeons, 1885–6. He contemplated the production of a monograph on the subject, but the pressure of hospital duties—for he rose on the staff with unusual rapidity—prevented this broad study, but the main results of his observations in Comparative Anatomy, led him to write an excellent account of the arrangements, disarrangements, malformations, and mechanical disturbance of the intestines of Man, for Morris's *Human Anatomy*, 1893.

I had many opportunities of studying his many-sided character, for he was a teacher, an anatomist, a lecturer with a graphic style, as well as a surgeon.

Treves's diligence and love of work were remarkable. Early to bed and early to rise; he was the embodiment of this ancient and familiar maxim. Much of the writing in the busy hospital period of his life was done in the morning before eight o'clock. He was the personification of method. When there was an unusual series of operations at the Hospital I sometimes accompanied him. Treves operated with neatness, courage, quickness, and decision based on a sound practical knowledge of Human Anatomy, and he was an expert dissector. He wore spectacles on account of myopia, but these were laid aside during the performance of an operation, and he seemed to peer into the wound. The part Treves played in forcing surgeons and later physicians, to recognize the serious and fatal consequences which arise from inflammation of the vermiform appendix is well known; it was a happy chance that extreme familiarity with mammalian bowels fitted him to be an exponent of this class of surgery.

For many years we were neighbours; I vividly remember an evening, in June 1901, walking with Treves along Queen Anne Street to our respective houses, and he seemed so unusually serious and quiet that it occurred to me he had a responsible case on hand. My surprise was great next morning when the news spread over London that King Edward had undergone an operation for an acute appendix-abscess, at the hands of Treves, in Buckingham Palace.

In the afternoon of the same day, in Cavendish Square, I met Hewitt, who administered the anæsthetic to King Edward, and I said to him: 'Now that a King, on the eve of his coronation, has submitted to an urgent oper-

MAN AND CHIMPANZEE

'Smile at the claims of long descent'

Tennyson

ation for the relief of appendicitis, patients will not add extra anxiety to their medical advisers by hesitating to accept prompt aid from surgeons when suffering from acute appendicitis.'

The cosmopolitan crowd of patients at the London Hospital gave Treves an unusual insight into humanity and enabled him to manifest keen interest in men and women—poor, sick, maimed and malformed. In many tales he told of benefactions bestowed on his poor hospital patients, Treves was frequently the intercessor—often the benefactor.

In my early days I often visited the Mile End Road, especially on Saturday nights, to see dwarfs, giants, fat-women, and monstrosities at the freak-shows. There was a freak-museum at a public-house—The Bell and Mackerel, near the London Hospital; this museum attracted customers. It was on one of these visits in 1884 I saw 'on show' opposite the London Hospital a repulsive human being—known as the Elephant-Man. This poor fellow—John Merrick—was deformed in body, head, face, and limbs. His skin,thick and pendulous, hung in folds and resembled the hide of an elephant —hence his show-name.

The poor fellow gave an elaborate story of a fright his mother received shortly before his birth from being knocked down by an elephant in a circus! My surprise was great a fortnight later to find this man exhibited by Treves to the Pathological Society of London. He not only submitted Merrick for examination by members of the Society, but published a detailed and illustrated description of this unfortunate man in the *Transactions* for 1885. His interest did not end with the clinical and pathological aspects of the Elephant-Man, who became an outcast on account of his extreme ugliness and the loathsome skin condition. None would give him lodging

except in an outhouse, or a stable, as if he were a wild animal.

When Treves became aware of these facts, he arranged with the Chairman of the Hospital, Mr. Carr Gomme, to have Merrick admitted into a small room where he was nursed and cared for until he died. He entered the Hospital in 1886 and was repeatedly visited by the Princess of Wales (afterwards Queen Alexandra), and she took a personal interest in him. It became a cult among the personal friends of the Princess to visit the Elephant-Man in the London Hospital. Merrick was well cared for and lived in comfort till 1890. He was found dead in his bed, and the cause of his death was not ascertained.

When Treves left London I missed him very much. He was an inspiration always original, and had his own way of looking at things and affairs; expressed his opinions fearlessly in lectures, demonstrations, consultations, and after-dinner speeches.

The subjoined letter, the last I received from him, illustrated his style of writing. It was written in response to a query of mine concerning a statement that Sir Everard Home had been able to investigate the method of reproduction in opossums, as some of these animals were kept in a menagerie in Richmond Park. Treves was living at Thatched House Lodge, in the Park, at the time he wrote:

'I have taken some pains to acquire a knowledge of the history of Richmond Park, but I have never heard of the Royal menagerie. I cannot think it possible. A strange animal or two might have been kept at the "kennels" merely because it was out of the way. The idea, until at least the reign of Queen Victoria, was to keep the Park wild. Animals of course have been let loose. Some idiot let loose the Grey Squirrel which has

become a plague. The foxes which are so numerous in the Isabella plantation probably belong to the place. The badgers were introduced. They are breeding out of all reason. The badger couple like to be alone and so are going further afield. It is wonderful what a hole they can make in an old oak fence and how quickly they dig. A couple tried to settle in my garden, and the hole they managed to dig in one night I kept untouched. Weasels are common here and I am sorry to say my gardener killed a polecat in the garden. Hares were fairly common when I came here ten years ago, but I have not turned up one for the last three or four years. Rabbits are a trouble, but I can manage to trap one a week. The peculiarities of rabbits have never been done justice to. Pheasants will insist upon breeding in my "wild" garden. Taking their eggs and hatching them out has not discouraged them. The birds here are quite magnificent. In spite of the war the nightingale has never left us. I still see the kingfisher; the Herons are as numerous as ever and the Crested Grebe still nests by the Pen Ponds. A brown Owl that perches upon a table on the terrace looks in the dusk as big as an eagle. I know no place where there are more owls than here. I take great pains with the birds and have nesting boxes. The winter 1916–17 was most disastrous and killed nearly all the tits. No fly-catchers came last year.

The birds are coming back earlier this year. Few Londoners will believe that I can nearly always show a long-tailed tit on Ham Common.

As I am never later than 6 a.m. and as I take a turn in the garden whether pitch dark or light, always at that hour I have seen a good many strange and beautiful things.

Yours sincerely,

FREDERICK TREVES.

March 28, 1918.

My last conversation with Treves was at Mentone. I had gone there for a fortnight at Christmas 1919, and we met quite accidentally at a Chocolate Shop, and discussed the exquisite beauty of an unusual close approach of the planet Venus to the crescent moon, visible that morning at six o'clock. Now when I spy the thin crescent, I always think of him. He died at Lausanne 1923.

When I began regular attendance at the Zoo, the assistant in charge of the Prosectorium, Edward Ockenden, gave me much valuable assistance. He was trained by Garrod and became skilful in preparing skeletons; especially of birds. When he came to the Gardens originally his handwriting was atrocious. To remedy this, Garrod set him to write for one hour daily in a copy-book until he acquired a bold, neat, round hand. Eventually he could with pen and ink write a label better than anyone I have known. Ockenden's pronunciation of scientific names of animals was odd in the extreme, and annoyed a classical man like Garrod. To remedy this defect, he arranged for Ockenden to sit on a stool daily and read aloud the Latin names of Beasts, Birds, and Reptiles from the Zoological Society's List of Vertebrate Animals. Ockenden eventually became Head-Keeper with a good house in the Gardens. He died in 1925, aged 73. Ockenden appears in the Jumbo photograph (*Plate XIV*). He served the Society fifty years, and was highly esteemed by many who had carried out anatomical investigations in the Prosectorium.

In my early days at the Zoo I performed small operations on the animals but with little success: monkeys especially resented surgical aid, they became frightened and struggled violently; scratched and bit the keepers badly, as well as the surgeon, that attempts to relieve them were more harmful than useful.

The lemurs are pretty animals and very liable to suffer

from cataract. I was very much attached to a ring-tailed lemur with a cataract in each eye, and asked A. D. Bartlett, the Superintendent, to allow me to remove them. He asked me if I had removed a cataract from a Man's eye successfully. I replied 'No'. He said indignantly, 'How can you expect me to let you operate on a lemur, if you have not operated on a Man successfully! This lemur is worth £50.' In spite of this Bartlett helped me in many ways in the pathological work. At that time it was impossible to rear young lions; they were usually born with cleft palates, and soon became rickety. I looked into this matter and found that by judiciously feeding the lioness, when pregnant, with goat-flesh and soft bones instead of horse-flesh and hard bones, matters improved. Whelps were born with complete palates, and by giving them cod-liver oil, bone dust and 'Infant's Food' good results followed. When we counted the cost it worked out this way: To rear a whelp on patent food and cod-liver oil, the cost was £50. A full-grown lion realizes £50. The method was interesting medically but not a pecuniary success.

During the five years I visited the Prosectorium I made a series of observations on bone-disease occurring in mammals living in the Gardens. The Museum of the Royal College of Surgeons contains my series of skulls and skeletons demonstrating the effects of rickets; and the specimens which I obtained in the Gardens are well displayed in the galleries.

The Museum of St. George's Hospital contains a skeleton of a thoroughly rickety monkey. On one occasion I showed some rickety skeletons of monkeys at the Pathological Society; Dr. Howship Dickinson, the President, referred to the St. George's specimen and said the changes in the monkey's bones were considered to be syphilitic. I knew the skeleton well and said I was

satisfied that the changes are due to rickets. Dickinson then expressed his pleasure that I had 'whitewashed the monkey's character'.

In 1881 the Office of the Zoological Society was at 11 Hanover Square: it was not merely an office, but also the library and the meeting-room, where Fellows of the Society met to exhibit specimens and discuss papers on zoological matters.

The attendance of Fellows at the monthly meetings was on an average about a score. The scientific meetings were instructive and afforded opportunities for exhibiting novelties in Zoology—and for studying the characters of Zoologists. This was the house where Professor Owen presented papers on the wonderful fossil remains of the great flightless birds of New Zealand. I ventured to read a paper in 1882 on *Diseases of Monkeys living in the Menagerie*. This opened for me an acquaintance with Sir Joseph Fayrer, who had retired from his appointment in India. He had written a monograph on the snakes of India and took great interest in the Society.

The first half-hour of a meeting was devoted to the exhibition of specimens: this was nearly always an interesting feature. Dr. Günther was keen to show a rare fish, a reptile, or a tortoise. Mr. Sclater, the Secretary, would exhibit and make remarks on 'additions to the Menagerie'. Sportsmen manifested pride in exhibiting heads of wild sheep with enormous horns which they had shot on the Pamir Plateau; or gigantic antlers of the moose and the wapiti from North America. Selous would send large nasal horns of the rhinoceros; or big antlers of the koodoo (kudu) from East Africa. The President, Sir William Flower, was interested in double tusks from narwhals (unicorns), or made remarks on rare marsupials, an Order of Mammals in which he was deeply interested.

Amusing discussions took place on particular varieties of birds exhibited to the Society, whether they should be regarded as new species. The 'birdmen' would be twitted by Ray Lankester on their love for species-mongering! It was a memorable occasion in 1901 when some strips of striped skin obtained in the Ituri Forest were shown by Sir Harry Johnston. This was the first opportunity zoologists had of becoming acquainted with an extraordinary beast now familiar to schoolboys—the Okapi.

The most astonishing exhibition I remember was a number of gorillas obtained in Cameroon; they were stuffed and mounted under conditions which insured accuracy. They were sent to the Society for exhibition (at 3 Hanover Square in 1906) by Mr. Walter Rothschild.

In 1883 I listened in the old room of the Society (11 Hanover Square) to a paper, read by T. W. Huxley, on the oviducts of Osmerus—on the relation of the Teleostean with the Ganoid Fishes. His clear, incisive style made a great impression on me. This was Huxley's last contribution to the Proceedings of the Zoological Society.

GIZZARDS

The serious side of the Society's meetings is occasionally relieved by the exhibition of curious 'finds' in the alimentary canal of an ostrich or a snake. The gizzard of some of these birds which die in the Gardens contains as many foreign coins as the offertory bag of a popular church! In 1927 the gizzard of a fine ostrich contained in addition to 3 handkerchiefs and a pair of gloves—one franc, two farthings, four halfpence, two staples, a tyre-valve, a stud, a pencil, a swivel, a screw, and a clock-winder!

There was no evidence, in spite of the number of odd bodies in the ostrich's gizzard, that any of them caused the death of this bird. Its companion, a fine bird, died a few days later; its gizzard contained a piece of wire six inches in length, which had pierced its wall and punctured the portal vein, causing death from hæmorrhage.

On Boxing Day 1917 I lunched with Rudyard Kipling at Burwash and discussed gizzards. I reminded him that the noise made by the grinding movements of stones in a gizzard were audible when the ear was applied to the sides of the fowl. He was keen for a demonstration. After lunch we visited the hen-roost and caught a complacent cockerel, and ausculted the chest. My friend was not only satisfied but interested; he suggested that the movement of the stones in the gizzard ought to be visible with the aid of X-rays.

A few days later I hired a fowl and had no difficulty in inducing it to lie in position on the X-ray table, and without distress. The movements of the stones, caused by the contraction of the muscular walls of the gizzard, were obvious. The stones were represented by shadows, with light streaks between them, which varied in size in response to the contraction and relaxation of the walls of the gizzard.

The great anteater is a curious beast and has a long tubular mouth devoid of teeth and a long flexible tongue covered with thick saliva with which it licks up ants. Owen many years ago described its stomach as being in many of its features like a gizzard.

The anteater depends on its tongue for collecting food; when the beast is active this long tongue slips in and out of its mouth, like a big roundworm, exploring cracks and holes in its cage.

A fine anteater lived in the Zoological Gardens and

a portion of the cage it occupied had been panelled off to make room for a raccoon-like dog—a playful and inquisitive little animal. It happened that a knot had slipped out of the panel and through the hole left by the knot the anteater twiddled its tongue. The dog watched, got a chance when the tongue came through this hole and bit off several inches! The anteater died—it was supposed from starvation. Being keen to examine its gizzard-like stomach, I made a post-mortem examination, and to my great surprise found the stomach and intestine distended with blood. This anteater had bled to death from the arteries in the stump of its tongue!

VICTOR HORSLEY

In 1876, when seriously bent on becoming a medical student, I attended two popular lectures on the Brain, delivered by Ferrier at the London Institution, Finsbury Circus. There I saw the human brain for the first time, and followed the matter closely by reading the experiments performed on the brains of pigeons by Flourens and Magendi. Six years later, in the course of my attendance at the Zoo, I had good opportunities for studying the Comparative Anatomy of Mammalian Brains, especially of Apes, and made a collection of them for teaching purposes. These brains became useful in an unexpected way.

In 1886 the Neurological Society was founded, and I was an original member. In the early days of this Society the meetings were not merely conferences where papers were read and discussed; they were laboratory meetings, and some of the most successful were held in the Physiological Laboratory of University College. I remember well the demonstrations of Professor Sharpey-Schafer who, at that time, was localizing experimentally the centre for hearing in the cerebral cortex of monkeys.

Horsley and Felix Semon gave demonstrations at such meetings on the centres in the cerebrum for movements of the vocal cords. All this work had been stirred up in a wonderful manner in 1885. In that year Hughes Bennett and Godlee at the Royal Medico-Chirurgical Society read a paper concerning an operation in which a tumour, localized by Hughes Bennett, in the brain of a man, was removed by Godlee. Although the man died a few days after the operation, it served to show that a tumour could be removed from the living brain. I was present at the meeting and heard Macewen of Glasgow and Horsley not only discuss the matter, but Macewen described some operations on the brain he had performed in Glasgow, followed by recovery. I feel sure that the foundation of the Neurological Society was the outcome of that meeting.

In 1887 Horsley successfully removed a tumour from the spinal cord of a man and became the pioneer of an extension of Surgery. I was present at the meeting of the Royal Medico-Chirurgical Society when the case was read and the convalescent patient exhibited. Ferrier maintained that Horsley's experimental work fitted him for such surgery.

I knew him and admired his restless enthusiasm. At that time he was keen to obtain a set of brains of the great apes, and I was able to supply him with some carefully prepared brains of the chimpanzee, orang, and Gibbon; and of smaller monkeys which I had obtained at the Zoo. Horsley was a man with a curious temper. In 1891 he gave a demonstration of pathogenic bacteria at the Pathological Society. At that time H. T. Butlin was Secretary, and at the end of the meeting hinted that micro-organisms were not in the domain of a Society devoted to Morbid Anatomy. This made Horsley furious! In the course of some correspondence arising

out of this incident, he called the Society a 'night school for morbid anatomists' and tried to ruin the Pathological Society by establishing a select Medical Research Club. I was an original member. This is a private club and meets five times a year; the number was originally limited to forty members, but this was afterwards raised to fifty. It is a flourishing club (1928).

At the Middlesex Hospital I followed intracranial surgery for a time, and successfully excised the Gasserian ganglion in several patients, and occasionally removed a cerebral tumour, or drained an abscess of the brain. In the course of the Great War I had opportunities of removing fragments of bone and missiles from the brain on many occasions. At the Middlesex Hospital there was no outstanding neurologist to attract patients requiring such surgery, and as I had plenty of tumours to remove from the abdominal cavity of women I reluctantly abandoned the cranial cavity to other surgeons.

My interest in the Morphology of the Brain has never subsided and my last contribution to this absorbing subject is an Address on Hydrocephalus delivered at St. George's Hospital 1928.

Horsley died in Mesopotamia, July 1916. Some months after his death a well-known lady—a spiritualist—wrote to me for a consultation at five o'clock on a stipulated day. Although the day and hour were inconvenient there was something impelling in the letter and I gave her an appointment.

On the day fixed, precisely at 5 p.m. she entered my room, and asked if I believed in spiritualism. I replied my mind was open on this subject. She then explained that her daughter complained of pain in the spine, and this induced her to ask Sir Victor Horsley to recommend a surgeon in London. I was perplexed and exclaimed, Horsley died in Mesopotamia some months ago! Quite

true, she replied, I arranged a séance at which Horsley's spirit would communicate and was advised to consult 'Bland-Sutton in Brook Street, and if the consultation could be fixed for five o'clock on Wednesday he would be present'. She read me the medical report—the phrasing and voice might have been Horsley speaking. After examining the X-ray plates I expressed the opinion that there was no obvious disease of the spine, and operative interference was unnecessary. There was no spiritualistic manifestation in the room. My visitor decided to arrange another séance and discuss my opinion with Horsley. My advice was followed.

SIR PATRICK MANSON

The histories of Timothy Lewis's discovery of the *Filaria sanguinis hominis* in the blood of a patient in Calcutta, and Manson's conviction of the mosquito as a conveyer of the parasite to Man, are as exciting as detective stories. Dr. Stephen Mackenzie had a patient under his care infected with filariæ and he showed at the Pathological Society of London, in 1882, specimens of the man's blood under the microscope. I attended the meeting and was astonished at the number of parasites in a drop of blood. They wriggled actively in the field of the microscope, and amused me by the manner in which they jostled the red corpuscles.

This was one of the first occasions in which filariæ had been exhibited in London. The discovery opened up a new chapter in the Natural History of Disease, which was appropriately styled The Flora and Fauna of the Blood.

Manson settled in London in 1890, and he lived at 21 Queen Anne Street, nearly opposite my house. He used one room as a Laboratory—simple and unpretentious but, as his biographer pertinently states, the room

was destined to become the nucleus of the London School of Tropical Medicine. We soon became friends, and when Manson had something unusual, rare, or new, in the way of blood-parasites he would ask me to look at it; he was also keen on the blood-parasites of the animals in the Zoological Gardens. Among the tropical diseases we discussed in this relation was the curious disease of the little toe, which occurs among negroes and East Indians, known by the odd name Ainhum, signifying to saw, or to cut, because it declares itself by the formation of a groove which gradually encircles the root of the toe and slowly sinks deeper and deeper until the toe drops off. It is unaccompanied by any disorder of the system. There are two examples of such toes in the Museum of the Middlesex Hospital. Nothing is known of the cause of ainhum. Manson was insatiable in his desire to know the causes of Tropical Diseases, and as he had seen in the Zoological Gardens several monkeys with changes at their tail-tips which resembled the toes of negroes afflicted with ainhum, he suggested to me that as many monkeys came from districts where this disease occurred they might well be subject to it. An examination of the tails of monkeys in the Prosectorium soon satisfied him that the damage was due to gangrene, the sequel of injuries in the cages, or incurred in combat with companions. The inquiry was useful in another way; whilst the monkeys were systematically inspected in regard to their tails, Manson's son tested their blood for filariæ. This parasite was found only in one monkey.

The most important event of all happened in October 1897, when Manson received from Calcutta two slides sent by Ronald Ross, showing the malaria-parasite in the stomach of a mosquito. He examined them and sent the slides to the Editor of the *British Medical Journal*

and requested him to transmit them to me for examination and report. I at once recognized the likeness of the objects on the slides to the malaria-parasite and had no hesitation in supporting Manson's statement. The mosquitoes on the slide had fed on a patient whose blood was known to contain malaria-parasites. The specimens demonstrated the extra-corporeal phase of the malaria-parasite.

In the early years of my friendship with Manson he discussed with me Laveran's discovery of the malaria-parasite (1880) and said it was of more importance than the discovery of the tubercle-bacillus, for it concerned an enormously greater number of human beings.

One of our most interesting discussions in his work-room in Queen Anne Street was over a minute oval organism derived from the splenic blood of a patient suffering from the then little known disease prevalent in Assam, called Kala-Azar. This organism, now known as the Leishman-Donovan body, had a large and a small nucleus; he drew my attention particularly to the smaller nucleus and said: 'When the life-history of this parasite is completely unravelled, this small nucleus in another stage becomes a flagellum!' This came to pass.

Forecasts of this kind have great charm for me. The really clever man, call him a prophet if you will, is he who can see a little further into the future than other men.

THE PROSECTORIUM AT THE ZOO

To-day Comparative Pathology is making rapid progress and its importance is fully appreciated by the able Secretary of the Zoological Society of London, Sir Peter Chalmers Mitchell. To-day the Prosectorium is well arranged, and equipped by competent men. Its

primary function is to ascertain the causes of death of animals in the menagerie, and to prevent the spread of contagious and infectious diseases among fishes, amphibians, reptiles, birds, and mammals which are collected from every part of the world.

The Prosectorium has on its staff an able pathologist, and co-operating with him a bacteriologist, and parasitologists, with well-trained assistants to superintend the collection and identification of ecto-parasites, internal parasites, and blood-parasites;—indeed the flora and fauna of living creatures.

The study of Comparative Pathology is by no means neglected, valuable material is investigated in the Prosectorium, and also distributed to anatomists all over the Kingdom.

CHAPTER X

ZOOLOGICAL GARDENS (*continued*)

TEETH AND TUSKS

WHEN a small boy, my curiosity was aroused in teeth; I had seen the skulls of rats, rabbits, and hares which had perished from starvation in consequence of injuries to their jaws; the incisors, or gnawing teeth, failed to antagonize, and as these teeth grow from persistent pulps they become long, and so curved that the animals could not open their mouths. In some of them, if one tooth lacks its antagonist, the healthy tooth continues to grow, and growing continually, describes a circle which may follow such an aberrant course as to penetrate the jaw, or the head of the animal. These are by no means uncommon conditions.

After entering the Middlesex Hospital my curiosity was further aroused in teeth because there were many Dental Students attending the school, and the Anatomy of Teeth was a perennial subject of discussion between the Medical and the Dental Students.

On becoming Demonstrator of Anatomy I recognized the importance of this problem and took out a course of Dental Anatomy in 1880, at the Royal Dental Hospital, under Sir Charles Tomes, who was at that time the leading authority on Comparative Dental Anatomy in Great Britain, and recognized for his researches on teeth. The knowledge I gained from his lectures helped me. At the Zoo many animals suffer from

diseases and displacements of their teeth. From being merely interested in overgrown incisors in rats and rabbits I was able to study dental troubles in beavers, and the elongated canines of wild boars, babirussas, and the tusks of elephants.

My interest was also aroused in septic diseases of the teeth of wild animals in captivity. In 1885 I reported some cases of infective diseases of their teeth and gums then known as Rigg's disease, now familiar as *Pyorrhœa alveolaris*. The most complete set of specimens I was able to secure was the dental tumours known as Odontomes; they are rare tumours in Man, but they occur in Mammals, and especially in association with teeth which grow from persistent pulps. Such tumours arising in connection with tusks of elephants attain an enormous size.

TUSKS

A tusk is that kind of tooth which has no bounds set to its growth except by abrasion (John Hunter). The best example of a tusk is that of the elephant; it is an enormous tooth which has no antagonist, and grows throughout the animal's life. In a big elephant it may attain a weight of 2 cwt.; I saw one as big as this in the ivory-room at Mombasa in 1910. Elephants use their tusks for offence, defence, and for service. The tusks wear down in digging roots, uprooting trees, or stripping them of bark. The canines or tushes of wild boars, which had become circles, like overgrown incisors of rats, puzzled me as a boy; such overgrown tusks are common in museums. My interest in these teeth and tusks was aroused by a specimen in the Museum of the Royal College of Surgeons, described and figured by Cheselden, the famous surgeon, who wrote a book, admirably illustrated, on the Human Skeleton, entitled

Osteographia, 1733. Later in life I learned that circular tusks from boars are worn by the natives of the New Hebrides as ornaments, and for ceremonial and religious purposes. The natives produce these circular tusks by knocking out the upper tusks (canines) of the boar and leaving the lower canines without antagonists. As the tusks grow from persistent pulps, their growth being unaffected, they form segments of circles; and if the tip of the tooth enters its own pulp it forms a complete circle. The hippopotamus is a huge pig, and its canines sometimes grow abnormally and form complete rings, as in the wild boar; such teeth are exhibited as curiosities in Zoological and Dental Museums.

It is exciting and instructive to watch a potter at work; a lump of soft clay on a revolving wheel, and with his fingers he fashions it in a way resembling Creative Art. From the earliest times the potter has made a deep impression on minds of thoughtful men—prophets, poets, and philosophers. When the potter acquired the art of glazing his clay productions, he made them imperishable. Gods, *Dii fictiles*, made by potters were worshipped by the Romans.

Teeth resemble pottery. In their early stages teeth are as soft as clay, but when their soft tissue becomes dentine, and the dentine is glazed with enamel, they are as indestructible as pottery.

Many animals which lived on the Earth, thousands of years ago, are only known to us by their teeth; and nations which once peopled large tracts of the globe are only known to us from fragments of pottery, and skulls containing teeth.

We are amused that savages revere overgrown tusks of wild boars; but let us remember that some of the most beautiful carved objects in the Western World are ivory crucifixes and crosiers. Ivory-carving attained great

perfection among Chinese, Japanese, and Hindus. Some of the ivory carvings which interest Europeans are the Nitsuké of Japan—attractive, realistic, and comic; many of them gems of art and as imperishable as pottery and teeth.

In 1887 I was elected as Honorary Member of the Odontological Society of Great Britain, and enjoyed the meetings. On one occasion I showed some specimens of malformed heads of chicks; one of the chicks—Dorking breed—had hatched out without a bill; with this deficiency its face resembled that of a little child. I drew the attention of the members to this simulation of a human face; a witty dentist at once rose and remarked that the chick would have been more human if it had many bills!

My papers on Dental Pathology are published in the *Transactions* of the Odontological Society, 1883–7, and many of the specimens are preserved in the Hunterian Museum, especially in the Odontological Collection. This fine collection was enlarged in 1927 and the specimens rearranged, described and catalogued, in order to make them accessible to students, by Sir Frank Colyer, who has for many years devoted time, care, and judgment to Comparative Odontology and Dental Pathology. This collection was enriched in 1926 by the microscopical slides prepared by Howard Mummery, who died in 1926.

In consequence of my interest in teeth, I was appointed Consulting Surgeon to the Royal Dental Hospital and on one occasion distributed prizes to the successful students. This entailed a short address in which I emphasized the interest connected with an intimate knowledge of Odontology, especially the Comparative Anatomy of Teeth, but warned the Dental Students that even a profound knowledge of Comparative Odontology would not compensate for a lack of skill in extracting

defective and diseased teeth; also in fitting dentures. Suffering at the time from an ill-fitting tooth-plate I ventured to express my experience in four lines:

A plate is apt to slip—it slips,
Under it slips a pip;
Neither my mobile tongue—nor lip
Can slip that currant pip.

OBSERVATIONS ON THE PSYCHOLOGY OF ANIMALS

It was once suggested to Charles Dickens that he should write a book on the behaviour and habits of animals in the Zoo. He replied that if he did write such a book the title would be, The Private Life of Public Friends.

In my spare time in the Gardens I visited the animals and birds in order to gather tales concerning their domestic life. There was a little Capuchin monkey much petted by the keeper; one frosty afternoon at dusk the keeper missed the monkey from its cage, and failed to find it in the house; he knew if the little fellow were free in the garden he would be frozen to death. After hunting in vain, the keeper went into the furnace-room to stoke the fire and to his astonishment, and joy, found the Capuchin sitting on a block of coal in front of the fire, with its head in its hands like a little child, trying to see faces in the fire!

BABOONS

In 1924-5 the Zoological Society constructed an ingenious monkey-hill to allow a troop of baboons to live under fairly natural conditions in London. A troop, consisting originally of 100 male and 20 female baboons, was introduced to Monkey Hill. Immediately a severe contest arose for possession of the females. A few lives

JUMBO AT THE HEIGHT OF HIS FAME

BEING FED WITH BUNS AND DAINTIES BY SCOTT, HIS KEEPER. THE MAN STANDING NEAR THE ELEPHANT'S LEG IS EDWARD OCKENDEN, THE PROSECTOR'S ASSISTANT

were lost; the contests ceased, and the bachelors appeared peaceful in their loneliness as far as female baboons were concerned. Two years later, the sympathy of the Fellows of the Society was incited by the monopoly of the females by the older baboons; recommendations were made to the Council in favour of a few extra females being introduced to Monkey Hill.

In due course half a score young female baboons were admitted into the domain and a terrific struggle followed; the older baboons forsook their wives and seized the newly imported spinsters. The struggle between these ferocious and hideous creatures was so desperate that the keepers dared not interfere. A few males were killed in the struggle. The old baboons appropriated the newly imported females; the bachelors took the cast-offs, and peace again reigned on Monkey Hill.

ELEPHANTS

An elephant appears docile and intelligent when carrying children for fun and buns in the Zoological Gardens, or allowing them to play with its trunk, but occasionally it is a source of danger to its keeper. The temper of an elephant is extremely variable; sometimes the animal is so gentle that it may be trusted with a child, and occasionally so vicious that it will kill and stamp the mahout flat. The famous African elephant Jumbo (*Plate XIV*), so popular in the Zoo in 1882, was at times very troublesome and broke its tusks; this led to the formation of huge abscesses in the jaws. With great boldness the Superintendent of the Gardens, A. D. Bartlett, and Scott the keeper, opened each abscess with a gardener's pruning knife. Jumbo was so sensible of the relief the operation afforded that the big fellow would kneel and allow the keeper to irrigate the abscess cavities with warm water. In due course the blunt end of each

tusk protruded through the openings in the skin of the cheek which were made to let out pus (*Plate XV*), instead of emerging under the upper lip in the normal manner.

Jumbo became a very dangerous beast; for this reason the Council sold him to Barnum. There was an extraordinary outburst of public indignation, for he was the most popular elephant the Zoo ever possessed, and children were brought to the Gardens in crowds to have their last ride on him. At that time money for riding on elephants and camels was the perquisite of their keepers. When the 'Jumbo craze' was at its height, Scott the keeper went home at night with his pockets crammed with silver coins. Cakes, biscuits, sweetmeats, and fruit were brought to the elephant in abundance, and on one occasion a barrel of oysters!

The removal of this elephant proved a difficult task, but at last strategy prevailed and when Jumbo was finally trapped in a travelling-box he became thoroughly cowed and pitiable. I was an eye-witness of the final stage of the Jumbo drama. Thompson, the Assistant-Superintendent, gave me a piece of Jumbo's tusk broken off in one of his fits. It is now preserved in the Elephant House at the Zoo.

SNAKES—FROGS

In the course of a year a large number of snakes, big and little, venomous and non-venomous, pass through the Reptile House. Skill and care are required in dealing with them, and it is satisfactory to record that accidents are rare. In the long course of my observations I have had only one opportunity of studying the effect of a snake-bite on the human subject, and this was in days before the use of antivenin.

In 1914 a young keeper engaged in transferring a rattle-snake from a travelling-box to the den intended

JUMBO, PEACEFUL BUT SUSPICIOUS

A FEW DAYS BEFORE HE WAS SHIPPED TO AMERICA, WITH SCOTT, HIS KEEPER, AND THOMPSON, ASSISTANT SUPERINTENDENT. THE VERY TALL MAN IS BARNUM'S AGENT

JUMBO WEIGHED FOUR TONS. HE WAS SOLD FOR £2,000. REACHED NEW YORK APRIL, 1882, AND WAS ACCIDENTALLY KILLED ON THE RAILWAY, 1885

for it, incautiously inserted his fingers too far under the glass-covering of the box; the snake immediately struck at the intruding fingers and merely scratched the skin of the first and second finger. They were not punctured but merely scratched. The skin wounds were at once treated with permanganate of potash, and a ligature applied to the arm. The man collapsed, and complained of backache and dizziness.

He was conveyed to the Middlesex Hospital and admitted under the care of Dr. W. Essex Wynter. I saw the man a few hours later; the whole limb was swollen to the shoulder and the skin became tense, and eventually purple, like a bruise. The patient's only complaint was in regard to the tenseness and heaviness of the limb. The most striking symptom was profuse hæmolysis; a large quantity of hæmoglobin passed with the urine and here and there on microscopic examination a red corpuscle was seen. In forty-eight hours all the disquieting symptoms passed off and in a few days the keeper was discharged from the Hospital. Dr. Wynter published an account of the case in the *Lancet*, 1914. It is certain that when the 'rattler' struck, only an extremely small quantity of venom entered the keeper's system.

SNAKES AND EGGS

Some kinds of snakes live on eggs, and a South African snake, *Dasypeltis* by name, has a special arrangement for breaking them. Bony processes on the under surface of the anterior vertebræ are unusually developed and project like teeth into the gullet. When the snake swallows an egg, it comes in contact with these bony pegs, which resemble teeth, and they break the shell. The soft contents of the egg flow down the gullet; the crushed and empty egg-shell is rejected.

Dasypeltis is a pretty snake and allows itself to be handled, and it is particular about eggs. If a warm egg from a sparrow's next is presented to it, the egg is swallowed with avidity. Mr. Boulanger informs me that if the shell of a stale egg be filled with albumen and yolk from a fresh egg, the snake will take it readily. It is, in fact, an epicure in eggs.

These facts throw some doubt on the following story, related to me by a nurse:

A gardener in Ceylon saw a snake leaving a hen-roost; it had a bulge in its belly. He blew off the head of the snake with a gun, and on slitting its belly he discovered a dummy china egg!

SNAKE AND FROG

This story I owe to Rudyard Kipling; he related it during lunch and wrote it afterwards on a slip of paper in my room. The slip I have preserved, and include the tale in this STORY because it is a capital example of note-taking which deserves to be studied, and imitated, by Clinical Clerks and Dressers when recording 'cases' in the Wards.

'At Batemans—a Grass Snake—the first seen in that garden, swallowed a frog, was killed by the gardener; the frog forming a perceptible bulge in the middle of the snake. Snake's head cut off by the gardener, and with a little help, the frog slid out *head* first. Marks of two fangs one on each side of the haunch, and body plentifully lubricated with saliva. Otherwise no damage. Frog emitted a low croak and was returned to his proper home among the lilies in the pond.

'Next day comes Grass-Snake's mate and was duly killed by the gardener who had prophesied {his / her} coming.

A SNAKE PROBLEM

These were the only snakes seen at Batemans in the whole of 22 years.' (9 March 1925.)

The psychology of snakes is incomprehensible to Man, hence their actions are often puzzling. I am indebted to Miss Joan Procter for the following Ophidian Problem:

Three snakes were living together in a den of the Reptile House:

Two were false Moccasins—A and B.

The third a Black Racer (*Zamenis*)—C.

A frog was introduced to them :

Moccasin A seized and swallowed the frog, and was promptly attacked and swallowed plus frog by Moccasin B.

The Black Racer C attacked B; and B vomits A plus frog, both dead.

B is killed by C.

Joan Procter explains:

The Black Racer killed the Moccasin B, not because it wanted the frog, but in a fit of excitement.

Most species of the genus *Zamenis* are ill-tempered (Gadow). This accords with their generic name.

SNAKE AND LIZARD

The tongue of the Silvery Tree-snake is coloured in the same style as its head; when the tongue is protruded through the rostral nick with the lips closed it appears to be a continuation of the snake's snout. Miss Procter has seen a lizard watching the hovering tongue in perplexity, quite engrossed and the snake striking at close range without startling the swift and cautious prey. The effect of this 'pulling faces' is most arresting to witness (*Plate XVI*).

SNAKES AND THEIR OWN VENOM

The Manager of the Hotel Anuradhapura, in the famous buried city of Ceylon, had, in 1919, a small collection of native wild animals such as a leopard, monkeys, spotted deer, a python, and two cobras, etc. The cobras he kept in a cleverly arranged box with a glass front in his office. For my edification a frog was placed in the box, and the cobra immediately struck and fastened on the frog in the sacral region and began to engorge it. This was not an easy matter, and one of the hind limbs of the frog stuck out of the cobra's mouth. On two occasions while we watched the snake released the frog, and at once struck again and in each instance failed to engulf the right hind limb. The frog made no effort to escape, it blinked and patiently awaited events. Early next morning I went to the office expecting to find the frog inside the cobra—no such thing; the cobra was coiled up at one end of the box and the frog sitting quite unconcerned at the other.

I was under the impression that venomous snakes use venom for procuring living prey as well as for defence. I am sure the frog was not poisoned. On returning to London I discussed this matter with Miss Joan Procter, Superintendent of Reptiles in the Zoological Gardens; she has had similar experience and believes the cobras use venom for protection—primarily. They hesitate to employ it when securing living prey. After discharging venom a snake is helpless until it has secreted sufficient for a second discharge. It would seem that poisonous snakes are conservative in regard to their poison.

The King Cobra is a big, very poisonous, and powerful snake. I once watched a King Cobra seize a grass-snake by the head and proceed to engorge it. The grass-snake, immediately it was seized, coiled the hinder half of its

SILVERY TREE-SNAKE FASCINATING A LIZARD

body round a thick piece of wood and resisted with all its might. It was an hour before this King Cobra completely engorged it. If the grass-snake had been poisoned it could not have struggled vigorously for an hour.

Conservation of venom is not peculiar to snakes. Mr. Bushby, Superintendent of the Insectorium at the Zoological Gardens, has observed that scorpions do not habitually use their poison for paralysing prey. He has observated a cockroach retained alive in the claws of a scorpion for two days while the captor leisurely sucked its soft tissues.

THE TREE-FROG

Some naturalists who study closely snakes and frogs consider the grass-frog 'an intelligent fellow'. Tree-frogs are delightful pets, and the favourite food of many kinds of snakes; they have adhesive disks—pads—on the tips of the fingers and toes (*Plate XVII*) which enable them to stick on slippery surface such as leaves; they can adhere as much by the belly as by digits. Joan Procter, appreciating my interest in frogs, named a new species of tree-frog after me. Its chief peculiarity is the brilliant turquoise-blue of its flanks. Tree-frogs can jump. The specimen represented in *Plate XVI* was sitting quietly and patiently on a table in front of an artist who was making a sketch of it; suddenly he missed the frog and looked around but failed to find it, and in despair sat at the table contemplating the sketch. A few moments later he was astonished to hear 'eep, eep, eep, eep', and felt something cold touch his ear!

It was the frog sitting on his shoulder and criticizing the sketch.

The Aquarium Reports are sometimes as startling as those received from the Reptilium. This is one: A

battle fought during the night in the Lobster Tank resulted in heavy casualties—three dead, and a loss of numerous claws among the survivors. (1928.)

A full-grown common Dogfish was swallowed by a Nursehound (the Great Spotted Dogfish) which swam round its tank for three days with the tail of the Dogfish protruding from its mouth. At the end of the third day it ejected the Dogfish—of course dead. (1928.)

My interest in Evolution was greatly intensified by observation in the Zoo, although I was mainly concerned with Comparative Pathology. In 1886 the Council of the Royal College of Surgeons appointed me Erasmus Wilson Lecturer in order that I might discuss problems of Comparative Pathology. I delivered a series of Lectures on Evolution and Disease which induced the Council to offer me a permanent post in the Hunterian Museum. This I declined. My aim was Surgery, for the simple reason that I preferred the 'quick to the dead'. I never regretted this decision. Hospital work and teaching has always been a pleasure to me. The company and friendship of students are ever congenial and stimulating to those who enjoy teaching.

I was appointed Lecturer on Comparative Anatomy at the Middlesex Hospital in 1883. In this capacity I delivered twenty lectures each year and with the modest emolument of £10 per annum. The Zoo was useful in this respect. Gradually I formed a collection of vertebrate skeletons in my house, but it grew so big that I dispersed it in 1888. The best specimens were purchased for the Medical School of St. Thomas's Hospital and remain there in excellent condition.

My predecessor as Lecturer of Comparative Anatomy at the Middlesex Hospital was Dr. James Murie, a cantankerous Scot. We became acquainted at the Zoological Society, and I was interested in him, for he

TREE-FROG (*Hyla blandsuttoni.* Procter)

SHOWING PADS ON THE TIPS OF THE FINGERS AND TOES

had done good anatomical work in the Prosectorium, but he quarrelled with everybody. Murie was with Consul Petherick at Gondokoro and met Speke when he came down the Nile, in 1863, after discovering its source. These events excited in me a longing to visit the source of the Nile.

CHAPTER XI

UGANDA AND THE SUDAN

IN January 1910, accompanied by my friend Comyns Berkeley, I travelled on the Uganda Railway from Nairobi to Port Florence, the boat-station on the Victoria Nyanza. Before embarking on the steamer for Entebbe we wandered along the shore of the lake watching the native fishermen, and had not proceeded far before a messenger came from Captain Gray warning us not to go too near the water, as crocodiles were apt to knock unwary persons into the lake with their powerful tails. We had a delightful passage across the lake and were welcomed by an old Middlesex student, Dr. A. E. Baker, Government Medical Officer in Kampala. We were entertained by the Club at Entebbe and then travelled by motor-bus to Kampala, where we were guests of Dr. and Mrs. Baker. Their home was in the midst of a large unfenced garden; in the early morning it was not uncommon to see a bushbuck enjoying the cabbages, or a pair of crowned cranes 'dancing' on a grass-plot. In the house a genet cat watched us slyly from a cushion on the most comfortable chair in the room.

Mrs. Baker had been trained as an artist and was fond of blue. A pergola which covered the pathway to the house was overrun with creeping plants of which the majority had blue flowers, and attracted blue butterflies and blue insects. She was also keen on lizards and

chameleons; they slowly crawled among the plants on the pergola and adjusted the tint of their skin to the colours of the leaves and flowers, and were not easily seen.

In addition to showing us the town, Dr. Baker arranged an interview with the Kabaka—Daudi Chwa. His tutor, Mr. Sturrocks, was also present. The Kabaka at that time was a dignified youth aged 14, spoke English well and was fond of English things. He received us in native clothes; then disappeared and soon reappeared properly dressed for golf.

Our object in visiting Uganda was to see the source of the Nile. We travelled from Kampala by rickshaw to the lake, and crossed in a dugout to Jinga, in order to reach Napoleon Gulf, and the Ripon Falls which mark the outflow of the lake.

We traversed a footway on the bank, amidst humped cattle with buff-backed herons picking ticks from their backs,—and suddenly came to a place where the water from the Victoria Nyanza flows over the 'stones' at Jinga—the birthplace of the Nile we had come so many miles to see. The rushing water carried over large fishes, and natives were securing them with spears, as in Speke's time. We lingered, charmed and fascinated with this delightful spot.

When we left Kampala Dr. Baker, to save us trouble, sent our suit-cases in advance by two native servants. We took the journey to the lake leisurely in rickshaws; it was evening, and sauntering along the shores of the great lake we listened to the tumultuous croaking of the frogs. I never heard so much noise made by frogs. When we reached the landing-stage my European servant met me with anxiety because the native boys had not arrived with our suit-cases; as the boat was ready to start we left without them. Later we learned that they had been stolen. Some months after returning to

London we were informed that two native boys had been arrested in Kampala; they were swaggering in dress-clothes, which were identified as the proceeds of the robbery. The suit-cases were found among elephant grass; they were locked, and as the thieves could not open them, they cut away the ends of the cases and withdrew everything they could reach. The odds and ends such as razors, combs, and scissors, usually lodged in recesses in suit-cases had not been extracted. The thieves were condemned to three months' imprisonment. Poor fellows! We were sorry for them.

Insect life in Uganda, though annoying, and at times extremely unpleasant, is from the zoologist's point of view, remarkable. One of the earliest stories we heard in Uganda referred to an incident on the railway shortly before our arrival; a train had been held up by caterpillars! I made inquiries and ascertained the facts: At one part of the railway track an enormous number of caterpillars were crawling across the rails and the brakes failed to act. Whilst in Entebbe I discussed this matter with Dr. C. A. Wiggins, an entomologist, and he informed me that on one occasion while travelling through the forest on a mule he suddenly came to a clearing; the mule refused to proceed—the whole of the open space was white, as if covered with a layer of snow. Dismounting, he found the ground covered with white butterflies. A multitude of butterflies helps us to realize that its production requires myriads of caterpillars.[1]

[1] In January 1929, while motoring in Ceylon from Trincomalee to Polonnarwara, my car ran for many miles through myriads of white butterflies. The air was so thick with them that the butterflies formed clusters on the wind-screen as if they were snowflakes; they seemed all of one species. Darwin (*Voyage of the 'Beagle'*) mentions bands or flocks of countless myriads of butterflies 'near the Bay of San Blas, Argentina'. The seamen cried out 'it was snowing butterflies', and such in fact was the appearance. This happened in December 1833.

PLOVER CHICK

The chief feature relating to Kampala was the curious Cathedral on the summit of Namirembe hill dominating the town. This cathedral was built of sun-dried bricks; thatched with dried grass, and its roof lined with polished stems of elephant grass. This cathedral was struck by lightning and completely destroyed a few months after our visit. It has been rebuilt. The almost perpetual sound made by native drums—morning, noon, and night—we shall never forget. The most impressive feature of the lake is its liability to electrical storms of great violence. They occur almost nightly. The insect discomforts should also be mentioned: Uganda abounds in ticks, jiggers, tsetse-flies, and mosquitoes. Insects, whether they creep, crawl, run or jump, or fly, are dreadful pests to natives. Indeed, a naked African might complain in these terms:

In daylight flies buzz —and bite,
In the dark gnats sing —and bite,
Day and night fleas jump—and bite,
Ticks stick fast to skin —and bite,
Jiggers to increase our woes,
Burrow deeply in our toes;
Red-driver ants neat and spry,
Eat us as in sleep we lie;
Lice breed in our woolly heads,
And grubs eat us when we're dead.

In December 1910, with Mr. H. A. Gwynne, Mrs. Gwynne and my wife, I went up the White Nile. On Christmas Day we dined with Bishop Gwynne at Khartum and on Boxing Day went up the river in order to visit Gondokoro, the scene of Sir Samuel Baker's exploits with the Bari Tribe and his notorious Forty Thieves.

While at Gondokoro we took the opportunity of going up the river as high as Rejaf, this being the station where Emin turned back the Mahdist forces. Emin was a

skilful collector of birds and butterflies, and when forced out of the Equatorial Provinces he sent, as opportunities occurred, letters containing observations relating to Natural History as well as boxes containing mammals' skins, birds' skins and butterflies to the Zoological Society in London. His last collection was received from the Victoria Nyanza in 1890.

The forest around Rejaf was a paradise for birds and Emin's enthusiasm for them is shown in a passage from one of his letters dated 1891:

'My heart beats higher now that I am again in a forest. The parrots flit whistling over my tent. On every side I hear the warbling of the *Korythaices* (touracos). A pigeon which I fail to identify is cooing in the bushes, and the monkeys are performing gymnastics in the tree-tops. It is a scene which compensates for all the troubles of active life.'

My visit to Rejaf was twenty years after the date of Emin's letter. Parrots whistled, touracos warbled in the forests, and the plaintive cooing of the long-tailed dove in the bushes haunts me to-day.

We returned to Khartum and stayed a few days; this gave me the opportunity of getting the birds I obtained in the Sudan identified by Mr. A. L. Butler, the Game Ranger, a charming and enthusiastic ornithologist as well as an authority on the birds of the Sudan. I had some instructive interviews with him, especially one relating to the Plover (*Pluvianus ægyptius*) which hops about the bodies of living crocodiles and rids them of vermin which lie in the creases of their thick skins.

Butler explained to me that the chicks of this bird are beautiful little things and he gave me the subjoined sketch (*Plate XVIII*). The chick is sand-coloured and sprinkled with black specks, with a black horseshoe mark encircling the back of the head, and behind it is a snow-white patch on the nape. This is a recognition

THE SHOEBILL BLINKING ITS BIG EYELIDS AMONG THE PAPYRUS IN THE SUDD

From the Drawing by H. Grönvold

mark, apparently to enable the old birds to keep them together, as they are very active and independent. When they run, the little white patch goes scudding over the sand like a piece of wind-blown cotton-wool and very conspicuous, but directly the young birds are alarmed by signal, their heads are drawn in and the white mark disappears entirely in the fold of the neck, leaving them absolutely the colour of the sand.

I was also interested in the weird bird known as the Shoebill (*Plate XIX*). The first living examples were brought to England by Petherick. In his original account of these birds he stated:—They also feed on the intestines of dead animals, the carcasses of which they easily rip open with the strong hook of the upper bill. He obtained them near Gondokoro and they were exhibited at the Zoological Gardens, Regent Park, in 1860. Butler made some observations on this bird which lives in the Sudd Region. He found it wading in open pools and shallows like a heron and feeding mainly on fish, but he found the skull of a rat and a small black rail in its stomach. He also noticed that shoebills are fond of resting on the top of ant-hills.

This strange bird was long known as the Whale-headed Stork, hence the scientific name *Balæniceps rex*; as its beak resembles an Arab slipper turned upside down, the natives call it 'Father of a Shoe'. It is difficult to imagine a shoebill capable of showing affection for a human being. Lady Wingate kept one of these birds in the Residency Gardens at Khartum, where it lived eleven years and was fond of its keeper and displayed affection by rattling its bill. I was lucky in witnessing a display which happened under a baobab tree in the Residency Gardens, the most northerly baobab in Africa; it was planted by Schweinfurth, German traveller and ethnologist.

On returning to Cairo I made an early-morning visit to the Zoological Gardens; Captain Stanley Flower showed me some fine lions of which he was justly proud, but I was more pleased to see three remarkable birds living in the same paddock—Secretary Bird, Saddle-billed Stork, and Shoebill—in excellent plumage. I have not seen finer examples.

Wild birds in their natural surroundings are more instructive than in dens and cages. A herd of elephants emerging from cover near the river, convoyed by a flock of buff-backed herons, is a glorious procession. Bee-eaters and sun-birds on the wing are delightful spectacles. A red-breasted shrike at the end of a leafless bough is characteristic of the thorn-orchards so common in the Sudan; a saddle-billed stork on a sand-bank, or a darter with its snake-like head and neck above the water excite interest in the dullest person. A marabou on the tip-top of a high tree, silent and motionless like a pinnacle, and the lily-trotter (Jacana) catching flies are visual memories which cannot fade as long as life lasts. (*Plate XX.*)

These journeys were so instructive that I ventured to write an account of them in a book called *Man and Beast in Eastern Ethiopia*, 1911.

When travelling through the Sudd Region of the Nile I noticed whenever we were returning to the boat, or to camp, from hunting, we met small groups of natives with their long spears, and men standing, as is their custom, on one leg, and they invariably asked this question—Is there any meat? It mattered not whether it was flesh or bowels, and if accessible to them it was eagerly devoured. There was a remarkable demonstration of this insatiable greed for meat at Bor when Captain Fox and Gwynne shot two elephants. After they had chopped out the tusks, being hot and uncomfortable, and as there was a large pool of water near, they took off

THE LILY-TROTTER OR JACANA TRIPPING ACROSS THE LEAVES OF WATER-LILIES IN THE SUDAN

From the Drawing by H. Grönvold

their clothes and bathed. While in the water, a crowd of native Dinka-women came down to the pool in a state of excitement. The clamour brought the interpreter on the scene. It was explained that the Dinka-women had never seen white men without clothes, and they wished my friends to come out of the water for them to see what they were like when naked! They were, of course, ushered away; there was no difficulty in this matter when there were two dead elephants at hand. The natives gathered round the carcasses and in two days there was little left for vultures and marabous except the skeletons.

F. C. SELOUS

My first meeting with this famous hunter-naturalist and explorer happened in a curious way. I was at an evening reception given by the late Sir Julius Wernher; a guest walked immediately in front of me whose linen collar had been ironed on the wrong side, and showed in large letters—F. C. Selous. In the course of the evening a friend told his wife that her husband was 'labelled'! She took him into another room and readjusted the collar.

I was glad to know Selous, having read his books with vivid interest. As years rolled on we met occasionally and I always gathered from him much first-hand knowledge concerning the animals and birds of Rhodesia, and the country along the Zambezi. He was always ready and willing to talk of his adventures and observations.

Selous was ambitious to shoot two lions at one shot. In early days he used a hammer-rifle. Once he unexpectedly came on two lions standing shoulder to shoulder with their heads in reverse directions broadside to him, and a few yards in front of him. Here was the chance—quietly raising the rifle he aimed for the

shoulder and pulled the trigger—the hammer stopped at half-cock—he quickly re-cocked the rifle and pulled the trigger; again the hammer stopped at half-cock. Selous was disgusted and flung the rifle at the lions—they fled. He never had another chance of gratifying his ambition.

I spent a delightful week-end in 1906 with Lady (Henry) Stanley at Woking. On Sunday afternoon we visited Mr. and Mrs. Selous at Worplesdon and examined the hunting-trophies in Selous' museum. I wished specially to examine the curious chignons of the Mashukulumbe, a tribe living on the Kafue River, Rhodesia. This style of head-dress is now a lost art because the neighbouring tribes laughed at the grotesque appearance of the wearers.

It was a happy thought to place in the Natural History Museum, on the wall of the Grand Staircase, a bronze half-figure of Selous in hunting-kit, holding his rifle in both hands. The Museum contains many trophies obtained by this intrepid hunter.

Adventures with lions always excite interest. In 1910 I was in Nairobi, and on the day of my arrival heard that Dr. A. D. Milne, the Principal Medical Officer of the East African Protectorate, was proceeding the previous evening, on his bicycle, along the main street of the town, when suddenly, in the dark, he ran into an animal. Ignorant of its nature he began to upbraid the creature for being loose in the High Street, and realized to his astonishment that the obstructing animal was a lion! Milne promptly fled in one direction—the lion in another.

Two days later I was dining with Milne, and of course questioned him on the lion-story, which he corroborated. Milne admitted that at the time he was not only

astonished but alarmed. The following morning I met the Game Ranger and asked him to explain the conduct of a lion wandering in the main street at eight o'clock in the evening. He replied, 'Come with me'. In the main street, not far from the place where Milne collided with the lion, there was a shop where visitors could buy native curios, skins, horns, tusks, live birds and small mammals. *In a strongly barred cage there was a beautiful young lioness in perfect condition.*

In 1898 I made my first journey up the Nile and was able to watch men laying the foundations of the dam at Assiût and at Aswân.

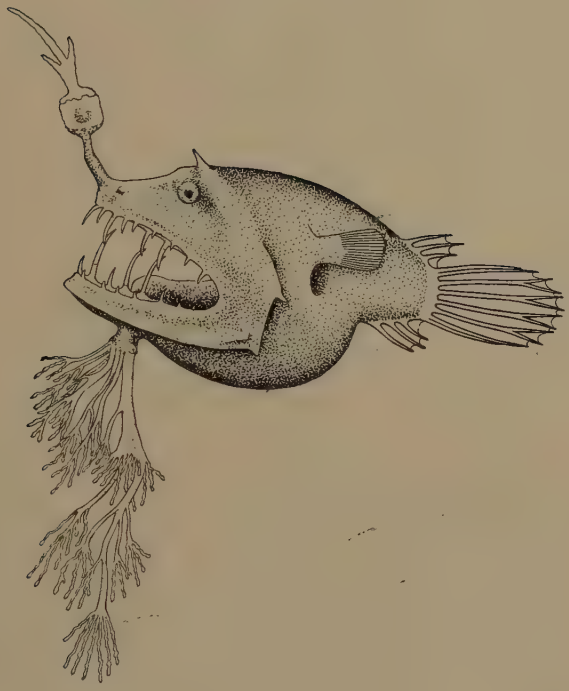
Twelve years later (1910) I came down the Nile from the Sudan and found Contractors busy raising the dam at Aswân an additional 16 feet. It was foreseen that the corresponding increase in the depth of the impounded water would destroy the pictures on the walls and pillars of the famous temple on the Island of Philæ. I stayed here in order that my wife should have the pleasure of examining these pictures before they were effaced, as well as the opportunity of walking across this wonderful dam.

CHAPTER XII

THE OMNIPOTENCE OF ZOOLOGY

ZOOLOGY is omnipotent among sciences and it is the oldest study in the world. We become familiar with it in the nursery, and our interest in it increases with our religious exercises. Eden was the first Zoological Gardens and Adam had the privilege of naming animals unfettered by priority of nomenclature which is the bugbear of learned zoologists. The Bible opens with a delightful jungle story: Eden—a jungle—where our first parents wandered in perfect happiness until they were disturbed by an Evil Spirit in the form of a wily snake under an apple-tree, and Eve, wishful for a change of diet, ate an apple, lost Eden and brought Sin and Death into the world.

The first travelling menagerie was Noah's Ark. Many have wondered how this famous collector of wild animals managed to induce such a mixed assembly to enter his floating barn—the Ark, when we realize the difficulty of keepers in transferring animals big, fierce, and strong from a paddock or den, into another den or paddock; or into the travelling-boxes of a menagerie. As children we listened with deep interest to Noah's expedient of sending forth a dove to obtain information as to the depth of the flood. We gape with astonishment at the story of the ass upbraiding Balaam for undeserved punishment; and the discernment of the lions which spared Daniel the prophet, but killed his



BATHYBIAL SEA-DEVIL WITH PHOSPHORESCENT LURE
(*after Tate Regan*)

accusers, their wives and children when they were cast into their den.

My favourite story is the Book of Tobit, a story of Jewish home-life during the captivity in Nineveh; it contains the amusing incident of the fish which leaped out of the Tigris and tried to bite Tobias when, with his dog and Raphael the angel, he was on his way to Ecbatane to recover a debt for his father and marry his cousin Sara.

CELESTIAL CREATURES—CHERUBIM

There is a tradition that ten animals have been admitted into heaven, among them, Jonah's whale, Abraham's ram, Balaam's ass, and Noah's dove. Some of the most remarkable imaginary animals are those described by Ezekiel, a Jew captive in Babylon. In a fit of religious ecstasy he saw celestial creatures—Cherubim, with four faces—of a man, of an ox, also of an eagle—four wings, and the hand of a man under each wing. The prophet's mind was distracted by the Assyrian sculptures—huge, hideous, and coloured vermilion—among which he lived. We obtain an idea of these weird creations in stone by examining the colossal sculptures in the Assyrian Galleries of the British Museum.

There are more wondrous creatures in the sea than Ezekiel imagined on land. In the depths of the sea there are fishes in form and habit so strange that Günther named them Bathybial Sea-Devils. Their heads are furnished with long filaments not unlike a fishing-line or the thong of a whip; near the end is a bulb containing a gland which secretes luminous slime. This appendage is called an illicium or bait; the phosphorescent bulb is a lure! 'Four beasts, full of eyes before and behind' were seen by John the Divine, but zealous marine zoologists have withdrawn from the depths of the sea, especially in Antarctic Regions, Marine creatures

which fulfil the Apocalyptic Vision, for their bodies are covered with luminous disks, resembling in shape and structure, eyes. Tate Regan has furnished these awe-inspiring goblins with Greek names and describes them as living eating-machines; with rows of terrible teeth for capture; a cavernous mouth for engulfing living fishes; and a stomach distensible beyond belief. (*Plate XXI.*)

A visit to the Marine Aquarium at Madras made me realize that anglers are more plastic to their surroundings than I imagined. In the Indian Ocean the angler is yellow and its pectoral fins resemble broad flat paws, with small claws, which enable it to move quickly in mud (*Plate XXII*). Its colour serves for camouflage among the seaweed, where it lies motionless. The first dorsal fin-ray inserted on the snout and movable in every direction, is modified into a fishing-rod and a fluffy white tassel at its end serves as a lure. By day the yellow angler rests on the floor of the tank; at dusk when the keeper approaches with food, the rod is erected and the tufts on the tassel waves rapidly as if stirred by a gust of wind. The food—pieces of fish—were quickly engulfed and the jaws closed with a snap. I was astonished to see such an apparently inert creature display so much adroitness. After feeding, or if danger threatens, the bait is lowered and its tassel-like end snuggles into a little pit between the strong spines immediately behind the fishing-rod.

Ovid's delightful stories interested the early naturalists, and in consequence we are constantly reminded of them by the scientific names applied by Linnæus and his followers to birds, beasts, reptiles, amphibians, fishes, insects—also plants. Astounding changes may be watched in an aquarium among barnacles, ascidians, crustaceans, and tadpoles, more amazing than the transformation of the Olympian Gods. We learn from Ovid,

SWORDTAIL (Natural size)

UPPER FISH IS FEMALE. LOWER FISH IS MALE

YELLOW ANGLER (Natural size)

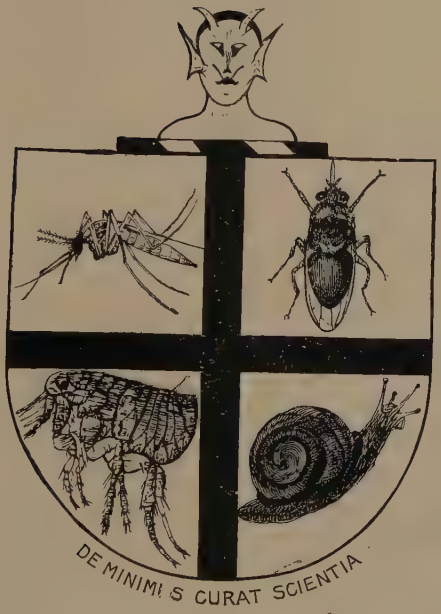
master of romance and vivid fancy, that Tiresias in his youth interfered with two engendering snakes and was in consequence transformed into a girl. Seven years later she saw the same pair of snakes again copulating and separated them with a stick. He was turned again into a man and became the most celebrated philosopher in Thebes.

Embryology is impotent to explain what determines sex in animals. Patient observation by able men has not shed any clear light on this matter. Among mammals whose embryology is known, in the early stages of development, male and female sex-glands are present. When one set of sex-glands—ovary or testis—attains predominance it is possible to determine the sex of the individual. Associated with this predominance is the development of the correlated sexual organs, and the acquisition of sexual maturity is declared by the appearance in due course of the secondary sexual characters. Among mammals, the sex once acquired is definite and unchangeable.

An astonishing example of sex-transformation occurs in the Mexican Swordtail common in aquaria. It is a pretty fish, almost transparent and about three inches long. In swordtails the sexes are distinct. In the male the anal-fin is represented as a pair of claspers, and the lower part of the tail is elongated, and in shape like a sword. The female has a tail of the usual shape among carp,—she produces viviparously. It happens not infrequently that after producing fry two or three times she changes her sex completely. The anal-fins become claspers, the lower part of the tail elongates into a 'sword' as in the male. Indeed the female becomes male, not only in the assumption of 'male livery' but sheds milt. The change is correlated with the acquisition of functional testes. (*Plate XXII.*)

INSECTS

Insects outnumber all other species of terrestrial animals. They are omnipotent, in spite of their small size, among animals in causing death and effacing their victims. Eastern races of Man from very early times have been interested in Insects from economic and religious points of view. The instinct of bees, the sociology of ants and the destructiveness of locusts have called forth praise, admiration, and denunciation from prophets, priests, and kings. In the Western World, lovers of nature, attracted by the colours of butterflies and beetles, collected them and laid the foundations of Entomology. Men appeared among them who observed their wonderful metamorphoses and made entomology a science. When medical men in the tropics discovered that biting insects carried disease-provoking parasites, new light was shed on infectious diseases and there arose a demand for trained entomologists. These discoveries led to the foundation of the School of Hygiene and Tropical Medicine in London. A year after the foundation of the School was laid, I was a guest at the Annual Dinner and my friend Professor Andrew Balfour asked me to reply to the Toast of the Guests. In a whimsical mood I amused myself by observing that the appropriate title for such a toast on such an occasion would be Hosts and Parasites, and ventured to suggest a coat of arms for the School. The *shield* should be spade-shaped because Moses knew the danger of health and life of unburied human excreta, and the shield should be charged with a *Red Cross*. In the first quarter, a mosquito should rest, this being the first insect associated with disease-provoking parasites. In the second quarter, a tsetse fly should settle. This fly did more to keep explorers and missionaries out of tropical Africa than naked



DESIGN FOR A COAT OF ARMS FOR A SCHOOL OF TROPICAL MEDICINE

natives armed with bows and arrows, javelins, and spears. In the third quarter a flea should hop; it is the most cosmopolitan insect, Man's closest companion; its ability to jump is proverbial; and it is difficult to catch and hard to kill. Fleas kill millions of persons annually in tropical and sub-tropical countries. In the fourth quarter a snail should crawl; this is the intermediate host of the Bilharzia hæmatobia which causes endemic hæmaturia throughout Africa. The Crest—Beelzebub, the god of flies, and of all insects the most dangerous to Man. (*Plate XXIII.*)

The motto, *De minimis curat scientia.*

FAUNA OF HERALDRY

The omnipotence of Zoology is manifest in Heraldry. Beasts are omnipotent in crests, shields, and seals: lion, leopard, elephant, camel, hare, hound, and many others. The King's Beasts which surmount the pinnacles of St. George's Chapel, Windsor, are splendid examples of fabled animals; among them:

> Lions crowned, and Lions white,
> Dragons in caricature;
> Yale and Unicorn unlike
> Anything seen in Nature.

Men and women harbour in the brain two fabled animals—hippocampus major and hippocampus minor. Grotesque animals, in lead or in stone, with open mouths —gargoyles—which spout rain-water from the roofs of abbeys, cathedrals, and castles—are often comic and amusing.

Birds are abundant in coats of arms; some sitting, others perching and a few in flight: eagle, falcon, hawk, owl, martlet, swallow, swan, duck, raven, ostrich, nuthatch, kingfisher, dove and plover. Fishes are not uncommon: pike, roach, sprat, and salmon, each play

on a name. Insects such as bees, flies and butterflies settle on quarterings.

THE CELESTIAL ZOO

How deeply Astrology was concerned with the stars in relation to Zoology is reflected in the *Vertebrate List* of the Celestial Zoo. The signs of the Zodiac are named after living creatures. We learn their names in the nursery. In the winter months in the British Isles we are delighted to watch the Great Bear and the Little Bear ambling round the Pole; also the Dog and the Little Dog hunting the lion with Orion near the Milky Way. Among the birds, in addition to a fine swan and a resplendent eagle we notice a friend:

> It is a very old raven,
> That never tasted cheese,
> He sits watching Jason's galley
> That never feels a breeze.

Fishes are not forgotten; there is one which flies, and two tied by their tails; heavenly fishes without bones and all have stars for scales. In the evening twilight when I hear the lions roaring in the Zoo I gaze at the sky and repeat to myself:

> Star-bespangled beasts keep the peace.
> They neither growl nor cry,
> Their groans and moans do not disturb
> The silence of the sky.

CHAPTER XIII

THE PERSIAN COURT

IN 1886 there were more Surgeons than Assistant-Surgeons at the Middlesex Hospital, and this led to an acute disagreement among the Surgeons in regard to their summer holiday. It ended, when the Hospital Board, on the advice of the Medical Committee, agreed to appoint an additional Assistant-Surgeon and making it a condition that as long as this officer remained the junior, he should stay in London and on duty during the long vacation—August and September. I was appointed Assistant-Surgeon, and accepted the conditions and remained junior thirteen years. In consequence of this arrangement I fell into the habit of leaving England in November and seeking the sun in warmer climes, and found it so pleasant as well as beneficial in regard to my health, that I followed the habit the rest of my life.

The Kaiser visited Palestine in 1898; Mr. John Cook was responsible for the arrangements of the tour. The Kaiser intended, after leaving Palestine, to make a trip up the Nile and the tourist steamer *Rameses II* was made ready. At the end of the Palestine tour, Wilhelm II, for reasons of State, hurriedly returned to Berlin and abandoned the Nile visit.

In November of that year I went to Cairo with the hope of going as far south as Wâdi Halfa. On reaching Cairo I was delighted to learn that Mr. John Cook was taking a party of friends on the *Rameses II*, as far as

Aswân. Alderman Treloar also joined the party, and accommodation was found for me.

When the boat reached the First Cataract, I transferred to the special boat which went into Nubia as far south as the great rock temple at Abu Simbel. The anxiety and worry connected with the Kaiser's trip upset Mr. Cook's health, and the trip up the Nile, though it improved his health, proved to be the last he made on the Nile. He died early in the following year.

The great temples filled me with astonishment, especially the hypostyle halls of the temple at Dendera, the temple of Ammon at Karnak, and the Ramesseum. One morning I was studying the hypostyle hall in the temple at Edfu, Treloar was with me and I said to him, 'I will build a hypostyle hall in London.' He was amused, and replied: 'An open-air court of this kind will not suit London.' I kept the idea in the forefront of my mind. A year later I saw in the Louvre the extraordinary bull-capital and enamelled friezes, which Marcel and Madame Dieulafoy had secured for France, from the ruins of the celebrated Apadana (Hall of Honour) built by Darius at Susa.

Darius died 486 B.C.; among his successors, Artaxerxes II (Mnemon) took great interest in this Apadana which is believed to be 'the court of the Garden of the King's Palace' where, when his heart was merry, he was severely snubbed by Queen Vashti. This led to a divorce and the rise to queenly power and estate of the Jewish maiden Esther, and the foundation of the Jewish festival—Purim.

In the hall of the Louvre, which contains architectural fragments from Susa, there was a model of the Apadana constructed from the designs of Marcel Dieulafoy. With this model for guidance I decided to build a dining-court for use—summer and winter—decorated with

PORTION OF THE PERSIAN COURT

SHOWING THE BULL COLUMNS, LION FRIEZE, ANGYRÔ-MAINYUS-AHRIMAN

columns and enamelled bricks as in the world-renowned hall at Susa.

Mr. W. E. Wheeller made an examination of the specimens in the Louvre, and the result is the dining-court at 47 Brook Street. The columns, the lions, and the archer-friezes have been reduced to scale from the colossal specimens exhibited in the Louvre.

The court is 40 feet square and 12 feet high; it is surmounted by a glass roof admitting sunlight and fitted with electric lights. It contains thirty-two bull-columns; twelve stand round the centre of the court and support the celebrated lion-friezes. The remaining twenty abut on the walls. The composite character of the columns arrests attention. (*Plate XXIV.*) The conjoint fore-parts of the bulls support the beams and joists. These rest on a curious capital of four volutes—the volutes being placed vertically and each ends in a double scroll. This capital is supported by a calyx-capital decorated with lotuses: these surmount a fluted Ionic shaft resting on a sculptured drum resembling an inverted lotus.

On looking closely at the head of the bull a blob is seen at each angle of the mouth, in shape like a Prince Rupert drop. For a time this blob puzzled me, until I recalled the fact that there is always a blob of saliva in this position in a living bull. In the photograph the blob is easily seen with a magnifying-glass.

The Persians adopted the hypostyle hall subsequent to their conquest of Egypt. The composite character of the columns is due to the influence of three countries. The fluted tapering shaft and volutes are Greek: the capital and the lotus-like drum-shaped base are Egyptian, and the bulls are Assyrian.

The enamelled bricks form the lion-friezes, and those covering the walls are very good. The artist has not only succeeded in reproducing the wonderful animation

of the lions but also the turquoise-blue so remarkable in the original. Prominence is given to the symbols of the religion of Zoroaster because Darius, shortly before he ascended the throne, had been instrumental in restoring this religion.

The walls are covered with glazed turquoise-blue bricks, with the celebrated archers as a frieze. The archers demand a few words. They represent the Ten Thousand Immortals, the guard of the Great King. They were arranged in ten battalions, and of these the Immortals of the first battalion had a golden pomegranate at the end of the javelin, hence their sobriquet—Malophori—apple-carriers! (*Plate XXV.*)

The Persians followed the teaching of Zoroaster—a form of religion followed by the Parsees. Ahura-Mazdâ (Ormuzd) they regard as the Creator of all things. He is represented as a beneficent person in the centre of a winged disk enclosed in a circle, and holds a small circle in his hand. In the court he hovers in the frieze above the architrave.

Angyrô-mainyus—Ahriman is the author of all ills and corresponds to the biblical Satan—god of darkness. Ahriman is represented in the court as a fantastic animal with a head like a lion, the fore-limbs of a cat, and the legs of an eagle, winged and tailed!

The curtains of the court are white mohair with borders of purple velvet arranged in squares. The centre of each square is occupied by a rosette from which four cones radiate, and the spaces between the arms contain expanded lotuses.

The designs for the decorations of the curtains were obtained in the following way: The Assyrian Saloon of the British Museum contains fragments of a large sculptured floor from Assyria; an examination of this fragment clearly indicates that a woven design served

PORTION OF THE WALL OF THE PERSIAN COURT

SHOWING THE FRIEZE OF THE IMMORTALS

as the model. The centre of each curtain is occupied by a medallion portrait of Artaxerxes (Mnemon) in *appliqué* copied from a daric.

In the reference to the original court in the Book of Esther mention is made of the hangings, 'fastened with cords of fine linen and purple to silver rings and pillars of marble'. The entrance to the court is by a broad flight of marble steps and flanked on each side by a moulding of the famous bas-relief representing an infuriated lion attacking a bull. It is copied from a sculpture among the ruins of the palace at Persepolis.

Monsieur Marcel Dieulafoy and Madame Jane Dieulafoy afforded much valuable assistance and advice during the preparation and decoration of the court. They were present at the opening ceremony, June 1905. Madame Dieulafoy was one of the few ladies in France who had the privilege of appearing in public in male attire. She acquired the habit while assisting her husband when excavating in Persia 1884; she attended the opening function at Brook Street dressed like a dainty courtier.

Note.—The model of the Apadana of Artaxerxes has been removed from the Louvre, but the fragments from Susa remain.

CHAPTER XIV

BOOKS

WRITING was congenial, but only on subjects which specially interested me. In editing or re-editing a book it is difficult to judge how much to add and how much to subtract.

I. *Ligaments. Their Nature and Morphology.* 1887.

An unpretentious little book, but it became popular with students. Its main object is to show that Morphology is the very soul of Anatomy. It is based on a series of papers published in the *Journal of Anatomy and Physiology.* 1882–6. In Chapter IX of this STORY will be found an account of the opportunities I enjoyed for obtaining Anatomical material in the Prosectorium of the Gardens of the Zoological Society.

The fourth Edition of *Ligaments* forms part of *Selected Lectures and Essays.* 1920.

II. *Evolution and Disease.* 1890.

This book was based on my work at the Zoological Gardens and it contains the substance of a series of Lectures delivered at the Royal College of Surgeons. 1884–9.

It made me popular with showmen who travelled with human and animal monstrosities which they exhibited in penny-shows. It also brought me many curious letters and specimens from persons interested in animals.

One amusing letter came from a poultry breeder interested in Leghorns. He propounded this conundrum: 'I castrated half a dozen cockerels, they soon recovered and in a few days were busy jumping the hens.' He asked for an explanation. I replied that he had failed to remove the testicles, and suggested that he should secure the cockerel most active with the hens and send it to me.

In a few days a fine Leghorn cockerel arrived with a recent scar in its flank. The laboratory attendant wrung his neck and on opening the abdomen I recognized two well-formed testes! I gave the bird to the attendant and suggested he should use it for dinner. Next day I asked him what became of the bird. He replied, 'My wife gave me *Poulet-en-cocotte* for dinner'.

Soon after the publication of my Lectures on Evolution and Disease, William Wilkes of Salisbury, Surgeon to the General Infirmary, invited me to spend a week-end with him and examine some children with malformations similar to some described in the lectures, especially a girl with an ear (auricle) in the neck. I found Wilkes to be a sage old man curiously proud of the fact that he had a vowel in the tail of his name in agreement with 'Wilkes and Liberty'. He believed that many families who, previous to Wilkes' imprisonment, spelt their name as Wilkes, became ashamed of the *e* and styled themselves Wilks! How far this is true I cannot decide. We became excellent friends, and I was often in Salisbury. On one occasion he summoned me from London to help him with an inmate in a private lunatic asylum; a poor fellow with a cut throat. Little could be done and the man died. At that time there was a naval officer under treatment in the asylum, who had some talent for making caricatures in water-colours. I admired one of them and he at once presented it to me. It represents a well-

known politician as a clown trying to balance a long feather from the tail of a peacock on his nose (*Plate XXVI*). This mad officer sold me the copyright for a pot of jam and a tin of tobacco; his name was Esau!

Wilkes, although blessed with a clever wife, chose his parlourmaids carefully, and preferred those who had had an illegitimate child. He argued, they had learned wisdom in the stern school of experience—and were not likely to err again!

Like most hospital surgeons he loved his work, not only on the surgical side, but especially from a human point of view, as it afforded opportunities for dealing sympathetically with all sorts and conditions of men, women and children—the poor, the maimed, the lame, the blind,—though they could not recompense him. Sometimes in amputating a limb, when his colleagues criticized the inequality of the skin-flaps, he would wittily retort with Hamlet's phrase:

> There's a divinity that shapes our ends
> Rough-hew them how we may.

Wilkes was not only an able surgeon, but had a stock of amusing stories; the following is a commentary on the advice of building on a rock. There was a house in, or near, Salisbury of which the chimney-stack became unstable and it was deemed necessary to underpin it in order to make it secure. In due course the work was started; the earth was removed and the foundations exposed. It was discovered that the wall rested on limestone and the heat of the fire had converted it into quicklime. Lunch time arrived and the workmen retired to enjoy their meal. During the interval there was a heavy rain-storm which filled the trench with water; this slaked the lime and caused such consequent damage to the chimney-stack that it had to be taken

A CLOWN BALANCING A FEATHER ON HIS NOSE

From a Drawing by a Lunatic

down and rebuilt, although it had been 'founded on a rock'.

I spent Easter-week 1926 in Salisbury, and on Easter Day went with my wife to morning service in the Cathedral. As the time for the sermon approached, a severe thunderstorm broke over the city and the Cathedral was filled with gross darkness. The electric lights were turned on—suddenly a vivid flash of lightning, followed by a clap of thunder, startled the congregation. The electric lights were extinguished and a covered wire, leading from the roof of the chancel to an electrolier, fizzled with flame. It was sudden and startling. A verger quickly and quietly took a pair of lighted candelabras to the pulpit, the preacher proceeded with his sermon, and the darkness slowly vanished.

Wilkes was on good terms with the Cathedral authorities. He introduced me to the Rev. Dr. Bourne, which led to the consultation on a hen Japanese pheasant which assumed male attire! (p. 125).

III. *Surgical Diseases of the Ovaries and Fallopian Tubes.* 1891.

The story of this book is curious. When Malcolm Morris was arranging the publication of a series of Manuals suitable for Practitioners and Students of Medicine, to be published by Cassell & Company, he took a holiday in Scotland. One day he called on a doctor he knew at Nairn, and found him absorbed reading my little book on *Evolution and Disease*. Malcolm Morris became interested in it and asked me to write a Manual for his Series on similar lines. At this time I had been collecting material for the Jacksonian Essay—On Diseases of the Ovaries and Fallopian Tubes—and suggested this as a subject for a Manual. Morris at once accepted it, and the book was published

in 1891. Its Preface excited indignation among Teachers of Midwifery in London. This astonished me and I venture to reproduce it:

'The literature relating to Surgical Diseases of the Ovaries displays a notorious amount of egoism. Nearly every treatise devoted to this subject is mainly a record of personal experience. In some instances self-consciousness has been carried to such a degree that the books consist of little else than the clinical histories of patients coming under the observation of their authors.

'In the present work a different plan has been followed, for though the book is largely based on personal investigation, full justice is done to the original work of other surgeons. This method is rarely followed by men engaged in that section of surgical craft known by the grandiloquent term—Gynæcology. Any attempt to put the pathology of extra-uterine gestation on a sound basis is rendered difficult by the large number of erroneous assertions, or as Jevons styled them—false facts, which abound in the literature of this important subject; they have retarded progress because it is often impossible to prove the falsity of records relating to specimens no longer in existence. For some years Lawson Tait has been slowly planning the overthrow of the ridiculous notions taught concerning the pathology of extra-uterine pregnancy. Although fertile in critical methods, by which he has undermined these opinions, he has never objectively demonstrated the reality of his conceptions in such a way as to cause an unequivocal explosion. I have attempted to assist in this useful iconoclastic endeavour. The time is not far distant when even teachers of Midwifery will wonder how they could have believed that an unimpregnated ovum would grow upon the peritoneum.'

A new edition in 1896 included the Essay for which I was awarded the Jacksonian Prize of the Royal College of Surgeons of England, 1892.

IV. *Human Osteology.*

This is an article, pp. 185 and 191, original engravings on wood, in Morris's *Treatise on Human Anatomy.* 1893.

A well-known firm of medical publishers consulted Henry Morris, who was for several years Lecturer on Anatomy at the Middlesex Hospital, to edit a textbook of Human Anatomy in collaboration with some prominent

teachers. The book was designed to meet the needs of candidates seeking the degrees and diplomas of the various Examining Boards. Morris discussed the matter with me, and arranged if I gave him editorial help and would write the Article on Osteology, he would accept the position of Editor. To this I agreed, and especially accepted the task of writing 'on the bones', because to many students 'learning the bones' is distasteful, in spite of the fact that a thorough knowledge of the human skeleton is the key to the structure of Man's body—and a prime essential for surgeons.

The skull of Man is a complex structure, and its complexities were ill-understood until Embryology shed light on the nature of its elements, and Evolution invested it with an interest impossible to assess. It is a pity that the detailed study of the skeleton should be difficult, but this is in some measure due to the dull method in which it is presented to Medical Students. In my article, the Cranial and Facial Bones are described from an embryological standpoint, and a thoughtful student who has mastered the mode of development of the occipital, sphenoid, and the temporal bones; and has followed the wonderful transformation of gill-arches—which are represented in the adult skull by the auditory ossicles and the mandible—can never doubt that in the early stages of development the human embryo is an aquatic parasite in its mother's womb, and then transforms into an air-breathing mammal.

V. *Tumours, Innocent and Malignant. Their Clinical Characters and Appropriate Treatment.* 1893.

This was a big undertaking. Eight years were spent in collecting and studying the material. The first issue was sold in a month. The idea underlying its production was the classification of Tumours on an Embry-

ological basis. Throughout the book, whenever possible, the nature of tumours is illustrated by reference to Comparative Pathology. Without this aid attempts to catch the deeper meaning of many tumours are as difficult as endeavouring to decipher a palimpsest in which the characters written in an unknown tongue have been imperfectly removed from the parchment, and are allowed to mingle with the second inscription.

A year after its publication I received a visit from Dr. Bernays, an American Surgeon practising in St. Louis, Missouri. I was glad to see him because he had published a good paper, on the origin of what is now known as *Lingual Goitre*, in *The St. Louis Medical and Surgical Journal.* In this article he drew attention to the origin of these tumours in the lingual duct discovered by Professor His. Bernays explained to me that he had studied Human Anatomy under Gegenbaur in Heidelberg, and became interested in Embryology. When about to return to St. Louis, to practise as a surgeon, he asked Gegenbaur to suggest a scientific subject bearing on Surgery which he could pursue in America. Gegenbaur recommended a *Treatise on Tumours* with a classification on an Embryological basis. Bernays decided to do this, and his surprise was great when a few months later the first edition of my book appeared.

Tumours, the most successful of my books, reached a seventh edition in 1922. Several friends, whose judgment I value on such matters, tried to induce me to prepare another edition. I have decided to let this book remain in its present form; it is evidence of the state of clinical knowledge in regard to Tumours in 1922.

In 1924 I published a book entitled *Orations and Addresses.* The chief item is the Hunterian Oration delivered at the Royal College of Surgeons, 14 February 1923. Mr. Rudyard Kipling was present at the Ban-

quet, and made a remarkable speech—SURGEONS AND THE SOUL—which is included in his *Book of Words*, 1928.

Under the title—Spolia Nemoralia—there is a description of the extraordinary shrunk-heads of the Aguaruna Indians living in the Amazonian Forest. The last half of the book is occupied with descriptions of the curious tumours which arise in relation with the membranes of the Brain and Spinal Cord, especially the choroid plexuses, which were named by Virchow—Psammomas—which I regard as some of the most extraordinary tumours which arise in Man. The last lecture of the series is devoted to the Ecology, or Habits of Tumours.

VI. *A Treatise on Fibroids of the Uterus.* 1913.

This book was written at the request of a friend; it summarizes my experience of these extremely common tumours. The description also includes their Natural History, and the methods of removing them. Hysterectomy for fibroids is unrivalled among surgical operations for its ability to amend invalid women by thousands. It enables them to lead useful lives, and if married, to be companions to their husbands. In this sense it is one of the most beneficial operations in Surgery.

The chief chapters were written in 1912 during a cruise in the Arctic Ocean, with whales blowing around. The voyage itself was full of interest. I joined a comfortable ship at Leith which then steamed along the East Coast of Scotland to the Orkneys and, as Scott expresses it, 'at the time of the year when the sun hardly thought it worth while to go to bed'. The ship stayed a day at Kirkwall, and this afforded an opportunity of visiting the solemn old edifice—the Cathedral of St. Magnus, which reminded me of Minna and Brenda Troil in Scott's story, *The Pirate*. Leaving Kirkwall the ship called at the curious treeless Faroe Islands, midway between the

Shetlands and Iceland. Although fogs are common and violent storms frequent at all seasons around these islands, we were lucky and had a beautiful day for a ramble ashore. We were equally fortunate in passing Westermann Islands and enjoyed the opportunity of watching enormous flocks of sea-birds.

On approaching Reykjavik we were amused by the puffins or sea-parrots, they seemed so comic swimming in the sea with their big beaks ornamented with red streaks—it was their breeding season. I was surprised to notice as we walked through the town puffins skinned and trussed like fowls for cooking, and to learn that Icelanders eat puffins! We stayed a few days in Iceland, and occasionally wandered on the shingly beach to watch the graceful prancing phalaropes; they breed in Iceland and Spitzbergen. Terns were present in great numbers; these sea-swallows lay their eggs on the shingly beach. They are graceful birds in summer plumage with their black caps. In the breeding season they are very bold. I discreetly walked along the beach searching for eggs—or chicks. The birds became angry and flew at me with such vigour that my wife became alarmed. Occasionally a tern came so close that I had to duck to avoid an unpleasant encounter! My best recollection of Iceland centres around puffins, terns, and phalaropes.

On leaving Iceland the ship steamed to Spitzbergen. On the way we sighted Jan Mayen Island; fortunately it was free of fog, and in due course we reached King's Bay and revelled in glaciers, floating-ice, seals, and whales. One of the party—a German ornithologist, shot a specimen of the great northern diver in splendid plumage. After watching a whaling-ship making its way among loose ice, we left the land of the midnight sun and superb glaciers with deep regret for Lapland, Hammerfest, and Hamburg, where we disembarked.

VII. *A Monograph on Gall-Stones and Diseases of the Bile-Ducts.*

This book consisted of a series of Lectures delivered at the Middlesex Hospital. The preparation of the book gave me congenial occupation for a year. It was published in 1907. A second edition in 1911. A German translation by Dr. Oscar Kraus was published in Leipsic and Vienna, 1911.

The sower scatters seed on prepared ground, knowing that some will be wasted. Teachers deliver lectures which they have prepared with great care, knowing that some of the students possess barren minds. The gall-stone lectures I prepared and delivered as a special series to senior students. At the end of the course I interrogated the students who attended this special course. I soon desisted for this reason:

I asked a student sitting on the front bench who had diligently attended the lectures, and apparently followed them with interest, this question:

What is the composition of an ordinary gall-stone?

Reply: I haven't the faintest notion. (Laughter.)

I said to him, What a pity. You might have gall-stones some day.

Reply: Thanks! I hope not. (Loud laughter.)

I continued, Why are you not interested in gall-stones?

Reply: I am a dental student. (Prolonged laughter.)

THE MYSTERY OF A RED LAMP

David Lloyd Roberts died in Manchester 1920, aged 85. He had been a successful practitioner of Midwifery, accumulated a considerable fortune, and collected a large number of old books relating to his speciality. He left sums of money in Manchester and London to be invested in order to provide honoraria for the delivery of

annual lectures. They are known as the Lloyd Roberts Lectures. In 1924 I was invited to deliver the lecture at Manchester, and choose for my subject *Attic Salt for Gall-stones*. In the lecture I took the opportunity of making fun of some of the odd substances which learned physicians occasionally prescribe, and particularly mentioned musk from the musk-deer. This peculiar substance is recommended as an antispasmodic for hysterical maidens.

After the lecture, the Trustee of the Fund handed me the cheque and explained that he was in the drug-trade, and specially amused by my reference to musk, and told me the following story: I am connected with a well-known firm of chemists, and the shop has a handsome 'red lamp' over the doorway. From time to time the glass of this lamp was broken and at last it became clear the damage was due to design. Watch was kept on the lamp. It then transpired that in a private house opposite the chemist's shop there lived a weak-minded woman. She was well-to-do, but had an intense dislike to the colour red; the chemist's red lamp on the opposite side of the street was obnoxious to her. As a remedy she obtained an air-gun and succeeded occasionally in breaking this red lamp. When the fair iconoclast was discovered, there arose this curious difficulty: Among her fancies, the lunatic believed in musk as a medicine. It had been prescribed for her by a fashionable physician, and she believed it did her good.

There are physicians who believe musk is useful as an antispasmodic, but they hesitate to prescribe it on account of its costliness and the difficulty of obtaining it free from adulteration. In the price-list of wholesale chemists it is quoted at £10 per ounce.

The weak-minded, lamp-breaking patient could afford to indulge her fancy, and took a dose of musk three

times daily. The powders were dispensed at the shop with the obnoxious red lamp!

After careful consideration the chemist decided that as he could easily recoup himself for the damage done to his lamp by the extravagant price obtained for the musk pills, he would submit to the occasional fracture of his red lamp!

VIII. *Selected Lectures and Essays.* 1920.

At the request of friends I collected a number of my Lectures on divers subjects and issued them in a convenient volume. The first part of the book is a new edition of *Ligaments*, for which there was a demand. The larger part of the book consists of Essays, e.g. Injuries of the Heart; Misplaced and Missing Organs; Atrocities of War; Pulque and Pulque-Drinking in Mexico; The Medicine of the Bible; The Tale of a Convoy; and The Science of the Bull-Ring.

The Article on the Bull-Ring was published in the *Morning Post* and it brought me some curious correspondence; I acquired my knowledge of the Bull-Ring in the following way:

In 1883 I took an autumn holiday in Lisbon and had an opportunity of witnessing a bull-fight. In Portugal the bulls are not killed in the ring and the horsemen, mounted on good horses, avoid the bull by skilful horsemanship. Horses are not killed by the bulls and the tips of their horns are capped by metal guards. There was plenty of excitement and no damage more serious than accidents which happen to horses, horsemen, and horsewomen amusing themselves hunting the fox, steeplechasing, or flat-racing. The experience stimulated me to witness a Spanish bull-fight.

Dr. W. A. Mackay, for many years Medical Officer at the Rio Tinto Mines, was a keen surgeon and visited

my wards, and the operation-room, at the Middlesex Hospital when he took his holidays in autumn. In this way he kept himself familiar with the progress of surgery in London. We often discussed bull-fighting, and as he knew the surgeon of the Bull-ring in Seville, invited me to spend a holiday in that town, and then go on to Huelva.

Accompanied by my wife, I went to Seville at Eastertide 1901 and we saw an excellent bull-fight. As I was anxious to make a careful examination of the parts concerned in the fatal stroke, I watched carefully for a bull to be killed by a single thrust from the leading matador of Spain. The last bull of six was killed in the orthodox style, and with Mackay's aid I made my way into the slaughter-house and was allowed to dissect the parts of the bull concerned in the master-stroke. The details are given in the *Article* mentioned. A curious incident happened as we pushed through the crowd to the slaughter-house: Mackay whispered in my ear, 'The fellow standing by me has taken cigarettes from my jacket-pocket, watch, his fingers will soon be in my waistcoat-pocket.' In a few moments he caught the thief's fingers in his waistcoat pocket! Turning to him, Mackay said in Spanish: 'No, my man, I have no pesetas to spare—go away.' The fellow quickly disappeared in the crowd.

From Seville we went to Huelva, as guests of the Rio Tinto Company, and visited the mines. Mackay arranged an excellent picnic to Palos, and a visit to the Covent of La Rabida, where Columbus received a sympathetic welcome, shelter, and encouragement from the prior of the monastery, at the time when he was seeking means for his voyage to find a route across the Western Ocean to the Indies. The monastery has been restored and the refectory is used as a room for visitors.

On the day of our visit a Spanish wedding party arrived, and the bridesmaids amused themselves with castanet dancing in the refectory. As the bride's parents were friends of Mackay we were included among the guests.

After lunch, Mackay's thoughts took a religious turn and he ended by reminding me that an illicit still was discovered in Scotland under Whitefield's Tabernacle.

The following Sunday this 'lament' was nailed on the door of the tabernacle:

> The spirits above are spirits of love,
> The spirits below are spirits of woe!
> The spirits above are spirits divine,
> The spirits below are spirits of wine.

IX. *The Principles of Doll-Surgery.* 1922.

Princess Marie Louise, when actively engaged in furnishing the unique Doll's House for Her Majesty Queen Mary, asked me to write this book for the Library. It is written in the style of a work on Operative Surgery and contains 74 pages; the size of the written page is $1\frac{1}{4}$ by 1 inch, and the whole book contains 1,000 words, and one illustration. This is the scale adopted by Swift for the little people he encountered in Lilliput. Each page contains an average of 14 words engrossed in old English letters and the initial letter of each chapter is illuminated as in an old English Missal.

In 1924 E. V. Lucas published a description of the Library of the Doll's House; a selection from the *Principles* is given—the chapter on the *Injuries to the Eyes of Dolls*.

It is useful in preparing books for the press to be familiar with the methods of type-setting. It saved me much time; editors much worry; and publishers money. Some authors treat proof with as little concern as teachers,

with a duster, deal with words written with chalk on a black-board.

Reviewing books I found distasteful, partly because my opinions were often expressed with such frankness as to offend. I always read carefully reviews of my own books in order to amend faults of style, correct errors and false references. Often I have been pleased with a review written by a friend and gained much from the criticisms of an adversary.

I made very little money by writing books because so much money was spent on preparing the illustrations. Nearly all were drawn and engraved on wood with great care.

> Charles Berjeau with skilful pencil
> Sketch'd my figures—like life they stood:
> Frank Butterworth with his burin,
> Engraved them deftly on the wood.

Printed in Great Britain by Butler & Tanner Ltd., Frome and London

METHUEN'S
GENERAL LITERATURE

A SELECTION OF
MESSRS. METHUEN'S PUBLICATIONS

This Catalogue contains only a selection of the more important books published by Messrs. Methuen. A complete catalogue of their publications may be obtained on application.

ARMSTRONG (Anthony) ('A. A.' of Punch)

WARRIORS AT EASE
WARRIORS STILL AT EASE
PERCIVAL AND I
PERCIVAL AT PLAY
HOW TO DO IT
Each 3*s.* 6*d. net.*

LIVESTOCK IN BARRACKS
Illustrated by E. H. SHEPARD.
6*s. net.*

BAIN (F. W.)

A DIGIT OF THE MOON
THE DESCENT OF THE SUN
A HEIFER OF THE DAWN
IN THE GREAT GOD'S HAIR
A DRAUGHT OF THE BLUE
AN ESSENCE OF THE DUSK
AN INCARNATION OF THE SNOW
A MINE OF FAULTS
THE ASHES OF A GOD
BUBBLES OF THE FOAM
A SYRUP OF THE BEES
THE LIVERY OF EVE
THE SUBSTANCE OF A DREAM
Each 3*s.* 6*d. net.*

AN ECHO OF THE SPHERES
10*s.* 6*d. net.*

BALFOUR (Sir Graham)

THE LIFE OF ROBERT LOUIS STEVENSON
Twentieth Edition. 7*s.* 6*d. net.*

BARKER (Ernest)

NATIONAL CHARACTER
10*s.* 6*d. net.*

GREEK POLITICAL THEORY
14*s. net.*

CHURCH, STATE AND SCHOOL
10*s.* 6*d. net.*

BELLOC (Hilaire)

PARIS 8*s.* 6*d. net.*
THE PYRENEES 8*s.* 6*d. net.*
MARIE ANTOINETTE 18*s. net.*
A HISTORY OF ENGLAND
In 5 Vols. Vols. I, II and III
Each 15*s. net.*

ON NOTHING
HILLS AND THE SEA
ON SOMETHING
THIS AND THAT AND THE OTHER
ON
FIRST AND LAST
ON EVERYTHING
ON ANYTHING
EMMANUEL BURDEN
A PICKED COMPANY
Each 3*s.* 6*d. net.*

BIRMINGHAM (George A.)

A WAYFARER IN HUNGARY
Illustrated. 8*s.* 6*d. net.*
SPILLIKINS : ESSAYS. 3*s.* 6*d. net.*
SHIPS AND SEALING-WAX : ESSAYS
3*s.* 6*d. net.*

BLEEK (Dorothea F.)
ROCK PAINTINGS FROM SOUTH AFRICA
Illustrated. £2 2s. *net.*

BUDGE (Sir E. A. Wallis)
A HISTORY OF ETHIOPIA: NUBIA AND ABYSSINIA
Illustrated. 2 vols. £3 13s. 6d. *net.*

CHESTERTON (G. K.)
G.K.C. AS M.C. 7s. 6d. *net.*
THE BALLAD OF THE WHITE HORSE 3s. 6d. *net.*
Also Illustrated by ROBERT AUSTIN. 12s. 6d. *net.*
CHARLES DICKENS
GENERALLY SPEAKING
ALL THINGS CONSIDERED
TREMENDOUS TRIFLES
FANCIES VERSUS FADS
ALARMS AND DISCURSIONS
A MISCELLANY OF MEN
THE USES OF DIVERSITY
THE OUTLINE OF SANITY
THE FLYING INN
Each 3s. 6d. *net.*
A GLEAMING COHORT 2s. 6d. *net.*
WINE, WATER AND SONG 1s. 6d. *net.*

CLUTTON-BROCK (A.)
WHAT IS THE KINGDOM OF HEAVEN?
ESSAYS ON ART
SHAKESPEARE'S HAMLET
Each 5s. *net.*
ESSAYS ON BOOKS 3s. 6d. *net.*
MORE ESSAYS ON BOOKS
ESSAYS ON LIFE
ESSAYS ON RELIGION
ESSAYS ON LITERATURE AND LIFE
MORE ESSAYS ON RELIGION
Each 6s. *net.*
SHELLEY, THE MAN AND THE POET 7s. 6d. *net.*

CRAWLEY (Ernest)
THE MYSTIC ROSE
Revised and Enlarged by THEODORE BESTERMAN. 2 vols. £1 10s. *net.*
STUDIES OF SAVAGES AND SEX
Edited by THEODORE BESTERMAN. 10s. 6d. *net.*

DAVIS (H. W. C.)
EUROPE FROM 800–1789
8s. 6d. *net.*

DERWENT (Lord)
GOYA. Illustrated. 10s. 6d. *net.*

DUGDALE (E. T. S.)
GERMAN DIPLOMATIC DOCUMENTS, 1871–1914
Selected from the Documents published by the German Foreign Office. In 4 vols. Vol. I, 1871–90. Vol. II, 1891–8. Vol. III, 1898–1910.
Each £1 1s. *net.*

EDWARDES (Tickner)
THE LORE OF THE HONEY-BEE
Illustrated. 7s. 6d. and 3s. 6d. *net.*
BEEKEEPING FOR ALL
Illustrated. 3s. 6d. *net.*
THE BEE-MASTER OF WARRILOW
Illustrated. 7s. 6d. *net.*
BEE-KEEPING DO'S AND DONT'S 2s. 6d. *net.*

EINSTEIN (Albert)
RELATIVITY: THE SPECIAL AND GENERAL THEORY 5s. *net.*
SIDELIGHTS ON RELATIVITY 3s. 6d. *net.*
THE MEANING OF RELATIVITY 5s. *net.*
THE BROWNIAN MOVEMENT 5s. *net.*

FIELD (G. C.)
MORAL THEORY 6s. *net.*
PLATO AND HIS CONTEMPORARIES 12s. 6d. *net.*

FOUQUET (Jean)
THE LIFE OF CHRIST AND HIS MOTHER
From Fouquet's 'Book of Hours'. Edited by FLORENCE HEYWOOD, B.A. With 24 Plates in Colours. In a box. £3 3s. *net.*

FYLEMAN (Rose)
FAIRIES AND CHIMNEYS
THE FAIRY GREEN
THE FAIRY FLUTE
THE RAINBOW CAT
EIGHT LITTLE PLAYS FOR CHILDREN
FORTY GOOD-NIGHT TALES
FAIRIES AND FRIENDS
THE ADVENTURE CLUB
FORTY GOOD-MORNING TALES
SEVEN LITTLE PLAYS FOR CHILDREN

FYLEMAN (Rose)—*continued*
TWENTY TEA-TIME TALES
Each 3*s.* 6*d. net.*
GAY GO UP
Illustrated by DECIE MERWIN.
5*s. net.*
THE ROSE FYLEMAN FAIRY BOOK
Illustrated by HILDA MILLER.
10*s.* 6*d. net.*
A GARLAND OF ROSE'S: COLLECTED POEMS
Illustrated by RENÉ BULL.
8*s.* 6*d. net.*

GIBBON (Edward)
THE DECLINE AND FALL OF THE ROMAN EMPIRE
With Notes, Appendixes and Maps, by J. B. BURY. Illustrated. 7 vols. *Demy* 8*vo.* 15*s. net* each volume. Also, unillustrated. *Crown* 8*vo.* 7*s.* 6*d. net* each volume.

GLADSTONE (Mary) (Mrs. Drew)
HER DIARIES AND LETTERS
Illustrated. £1 1*s. net.*

GLOVER (T. R.)
VIRGIL
THE CONFLICT OF RELIGIONS IN THE EARLY ROMAN EMPIRE
POETS AND PURITANS
Each 10*s.* 6*d. net.*
FROM PERICLES TO PHILIP
12*s.* 6*d. net.*

GRAHAM (Harry)
THE WORLD WE LAUGH IN: More Deportmental Ditties
Illustrated by 'FISH'. *Seventh Edition.* 5*s. net.*
STRAINED RELATIONS
Illustrated by H. STUART MENZIES and HENDY 6*s. net.*
THE WORLD'S WORKERS
Illustrated by 'FOUGASSE'.
5*s. net.*

GRAHAME (Kenneth)
THE WIND IN THE WILLOWS
Nineteenth Edition. 7*s.* 6*d. net.*
Also illustrated by WYNDHAM PAYNE. 7*s.* 6*d. net.*
Also unillustrated. 3*s.* 6*d. net.*

See also **Milne (A. A.)**

HADFIELD (J. A.)
PSYCHOLOGY AND MORALS
Seventh Edition. Crown 8*vo.* 6*s. net.*

HALL (H. R.)
THE ANCIENT HISTORY OF THE NEAR EAST
Illustrated. £1 1*s. net*
THE CIVILIZATION OF GREECE IN THE BRONZE AGE
Illustrated. £1 10*s. net.*
A SEASON'S WORK AT UR OF THE CHALDEES. Illustrated. 15*s. net*

HEADLAM-MORLEY (Sir James)
STUDIES IN DIPLOMATIC HISTORY
10*s.* 6*d. net.*

HERBERT (A. P.)
HONEYBUBBLE & CO. 6*s. net.*
MISLEADING CASES IN THE COMMON LAW
With an Introduction by LORD HEWART. 5*s. net.*
THE BOMBER GIPSY 3*s.* 6*d. net.*
LIGHT ARTICLES ONLY
Illustrated. 6*s. net.*
THE WHEREFORE AND THE WHY
Illustrated. 3*s.* 6*d. net.*
THE SECRET BATTLE 3*s.* 6*d. net.*

HOLDSWORTH (W. S.)
A HISTORY OF ENGLISH LAW
Nine Volumes. £1 5*s. net each.*

HUDSON (W. H.)
A SHEPHERD'S LIFE
Illustrated. 10*s.* 6*d. net.*
Also unillustrated. 3*s.* 6*d. net.*

HUTTON (Edward)
CITIES OF SICILY
Illustrated. 10*s.* 6*d. net.*
MILAN AND LOMBARDY
THE CITIES OF ROMAGNA AND THE MARCHES
SIENA AND SOUTHERN TUSCANY
NAPLES AND SOUTHERN ITALY
Illustrated. *Each* 8*s.* 6*d. net.*
A WAYFARER IN UNKNOWN TUSCANY
THE CITIES OF SPAIN
THE CITIES OF UMBRIA
COUNTRY WALKS ABOUT FLORENCE
ROME
FLORENCE AND NORTHERN TUSCANY
VENICE AND VENETIA
Illustrated. Each 7*s.* 6*d. net.*

INGE (W. R.), D.D., Dean of St. Paul's
CHRISTIAN MYSTICISM
(The Bampton Lectures of 1899).
Sixth Edition. 7*s.* 6*d. net.*

KIPLING (Rudyard)

BARRACK-ROOM BALLADS
254*th Thousand.*
THE SEVEN SEAS
185*th Thousand.*
THE FIVE NATIONS
143*rd Thousand.*
DEPARTMENTAL DITTIES
116*th Thousand.*
THE YEARS BETWEEN
95*th Thousand.*
Four Editions of these famous volumes of poems are now published, viz. :—
Crown 8*vo. Buckram, 7s. 6d. net.*
Fcap. 8*vo. Cloth 6s. net.*
Leather. 7s. 6d. net.
Service Edition. Two volumes each book. *Square Fcap.* 8*vo.* 3*s. net* each volume.
A KIPLING ANTHOLOGY: Verse. *Cloth, 6s. net* and 3*s. 6d. net.*
TWENTY POEMS FROM RUDYARD KIPLING
482*nd Thousand.* 1*s. net.*
A CHOICE OF SONGS
Second Edition. 2*s. net.*

LAMB (Charles and Mary)

THE COMPLETE WORKS
Edited by E. V. LUCAS. Six Volumes. With Frontispieces. 6*s. net each.*
SELECTED LETTERS
Edited by G. T. CLAPTON. 3*s. 6d. net.*
THE CHARLES LAMB DAY BOOK
Compiled by E. V. LUCAS. 6*s. net.*

LANKESTER (Sir Ray)

SCIENCE FROM AN EASY CHAIR
SCIENCE FROM AN EASY CHAIR: Second Series
DIVERSIONS OF A NATURALIST
GREAT AND SMALL THINGS
Illustrated. *Each 7s. 6d. net.*
SECRETS OF EARTH AND SEA
Illustrated. 8*s. 6d. net.*

LODGE (Sir Oliver)

MAN AND THE UNIVERSE
7*s. 6d. net and* 3*s. 6d. net.*
THE SURVIVAL OF MAN
7*s. 6d. net.*
RAYMOND 10*s. 6d. net.*
RAYMOND REVISED 6*s. net.*
MODERN PROBLEMS 3*s. 6d. net.*
REASON AND BELIEF 3*s. 6d. net.*
THE SUBSTANCE OF FAITH
2*s. net.*
RELATIVITY 1*s. net.*

LUCAS (E. V.)

THE LIFE OF CHARLES LAMB
2 Vols. £1 1*s. net.*
THE COLVINS AND THEIR FRIENDS
£1 1*s. net.*
VERMEER THE MAGICAL 5*s. net.*
A WANDERER IN ROME
A WANDERER IN HOLLAND
A WANDERER IN LONDON
LONDON REVISITED (Revised)
A WANDERER IN PARIS
A WANDERER IN FLORENCE
A WANDERER IN VENICE
Each 10*s. 6d. net.*
A WANDERER AMONG PICTURES
8*s. 6d. net.*
E. V. LUCAS'S LONDON £1 *net.*
INTRODUCING LONDON
INTRODUCING PARIS
Each 2*s. 6d. net.*
THE OPEN ROAD 6*s. net.*
Also, illustrated by CLAUDE A. SHEPPERSON, A.R.W.S.
10*s. 6d. net.*
Also, India Paper.
Leather, 7s. 6d. net.
THE JOY OF LIFE
6*s. net. Leather Edition,* 7*s. 6d. net.*
Also India Paper.
Leather, 7s. 6d. net.
THE GENTLEST ART 6*s. 6d. net.*
And THE SECOND POST 6*s. net.*
Also together in one volume.
7*s. 6d. net.*
FIRESIDE AND SUNSHINE
CHARACTER AND COMEDY
GOOD COMPANY
ONE DAY AND ANOTHER
OLD LAMPS FOR NEW
LOITERER'S HARVEST
LUCK OF THE YEAR
EVENTS AND EMBROIDERIES
A FRONDED ISLE
A ROVER I WOULD BE
GIVING AND RECEIVING
Each 3*s. 6d. net.*
HER INFINITE VARIETY
CLOUD AND SILVER
A BOSWELL OF BAGHDAD
'TWIXT EAGLE AND DOVE
THE PHANTOM JOURNAL
ENCOUNTERS AND DIVERSIONS
ZIGZAGS IN FRANCE
TURNING THINGS OVER
Each 6*s. net.*

LUCAS (E. V.)—*continued*

ROVING EAST AND ROVING WEST
5*s. net.*

Mr. Punch's COUNTY SONGS
Illustrated by E. H. SHEPARD.
10*s.* 6*d. net.*

'THE MORE I SEE OF MEN . . .'

OUT OF A CLEAR SKY

IF DOGS COULD WRITE
Each 3*s.* 6*d. net.*

See also **Lamb (Charles).**

LYND (Robert)

IT'S A FINE WORLD 5*s. net.*

THE GREEN MAN

THE PLEASURES OF IGNORANCE

THE GOLDFISH

THE LITTLE ANGEL

THE BLUE LION

THE PEAL OF BELLS

THE MONEY-BOX

THE ORANGE TREE
Each 3*s.* 6*d. net.*

McDOUGALL (William)

AN INTRODUCTION TO SOCIAL PSYCHOLOGY 10*s.* 6*d. net.*

NATIONAL WELFARE AND NATIONAL DECAY 6*s. net.*

AN OUTLINE OF PSYCHOLOGY
10*s.* 6*d. net.*

AN OUTLINE OF ABNORMAL PSYCHOLOGY 15*s. net.*

BODY AND MIND 12*s.* 6*d. net.*

CHARACTER AND THE CONDUCT OF LIFE 10*s.* 6*d. net.*

MODERN MATERIALISM AND EMERGENT EVOLUTION 7*s.* 6*d. net.*

ETHICS AND SOME MODERN WORLD PROBLEMS 7*s.* 6*d. net.*

MALLET (Sir C. E.)

A HISTORY OF THE UNIVERSITY OF OXFORD
In 3 vols. *Each* £1 1*s. net.*

MAETERLINCK (Maurice)

THE BLUE BIRD 6*s. net.*
Also, illustrated by F. CAYLEY ROBINSON. 10*s.* 6*d. net.*

OUR ETERNITY 6*s. net.*

THE UNKNOWN GUEST 6*s. net.*

POEMS 5*s. net.*

THE WRACK OF THE STORM
6*s. net.*

THE BURGOMASTER OF STILEMONDE
5*s. net.*

THE BETROTHAL 6*s. net.*

MOUNTAIN PATHS 6*s. net.*

THE GREAT SECRET 7*s.* 6*d. net.*

THE CLOUD THAT LIFTED and THE POWER OF THE DEAD
7*s.* 6*d. net.*

MARY MAGDALENE 2*s. net.*

MARLOWE (Christopher)

THE WORKS. In 7 volumes.
General Editor, R. H. Case.

THE LIFE OF MARLOWE and DIDO.
Edited by C. F. Tucker Brooke.
8*s.* 6*d. net.*

TAMBURLAINE, I AND II. Edited by U. M. Ellis-Fermor.
10*s.* 6*d. net.*

MASEFIELD (John)

ON THE SPANISH MAIN
8*s.* 6*d. net.*

A SAILOR'S GARLAND 3*s.* 6*d. net.*

SEA LIFE IN NELSON'S TIME
7*s.* 6*d. net.*

METHUEN (Sir A.)

AN ANTHOLOGY OF MODERN VERSE
185*th Thousand.*

SHAKESPEARE TO HARDY: An Anthology of English Lyrics
26*th Thousand.*
Each, Cloth, 6*s. net.*
Leather, 7*s.* 6*d. net.*

MILNE (A. A.)

BY WAY OF INTRODUCTION.
6*s. net.*

TOAD OF TOAD HALL
A Play founded on Kenneth Grahame's 'The Wind in the Willows.' 5*s. net.*

THOSE WERE THE DAYS
7*s.* 6*d net.*

NOT THAT IT MATTERS

IF I MAY

THE SUNNY SIDE

THE RED HOUSE MYSTERY

ONCE A WEEK

THE HOLIDAY ROUND

THE DAY'S PLAY

MR. PIM PASSES BY
Each 3*s.* 6*d. net*

WHEN WE WERE VERY YOUNG
Twentieth Edition. 206*th Thousand.*

WINNIE-THE-POOH
Ninth Edition. 111*th Thousand.*

NOW WE ARE SIX
Fifth Edition. 119*th Thousand.*

THE HOUSE AT POOH CORNER
Third Edition. 105*th Thousand.*
Each illustrated by E. H. SHEPARD.
7*s.* 6*d. net.*
Leather, 10*s.* 6*d. net.*

MILNE (A. A.)—*continued*
THE CHRISTOPHER ROBIN STORY BOOK. *Second Edition.*
Illustrated by E. H. SHEPARD.
5*s. net.*

MILNE (A. A.) and FRASER-SIMSON (H.)
FOURTEEN SONGS FROM 'WHEN WE WERE VERY YOUNG'
Twelfth Edition. 7*s.* 6*d. net.*
TEDDY BEAR AND OTHER SONGS FROM 'WHEN WE WERE VERY YOUNG' 7*s.* 6*d. net.*
THE KING'S BREAKFAST
Third Edition. 3*s.* 6*d. net.*
SONGS FROM 'NOW WE ARE SIX'
Second Edition. 7*s.* 6*d. net.*
MORE 'VERY YOUNG' SONGS
7*s.* 6*d. net.*
THE HUMS OF POOH
7*s.* 6*d. net.*
Words by A. A. MILNE.
Music by H. FRASER-SIMSON.
Decorations by E. H. SHEPARD.

MORTON (H. V.)
THE HEART OF LONDON
THE SPELL OF LONDON
THE NIGHTS OF LONDON
Each 3*s.* 6*d. net.*
IN SEARCH OF ENGLAND
THE CALL OF ENGLAND
IN SEARCH OF SCOTLAND
Each illustrated. 7*s.* 6*d. net.*
THE SOUL OF SCOTLAND 1*s. net.*

OMAN (Sir Charles)
A HISTORY OF THE ART OF WAR IN THE MIDDLE AGES, A.D. 378–1485
2 vols. Illustrated. £1 16*s. net.*
STUDIES IN THE NAPOLEONIC WARS
8*s.* 6*d. net.*

PERRY (W. J.)
THE ORIGIN OF MAGIC AND RELIGION
THE GROWTH OF CIVILIZATION
Each 6*s. net.*
THE CHILDREN OF THE SUN
£1 1*s. net.*

PETRIE (Sir Flinders)
A HISTORY OF EGYPT
In 6 Volumes.
Vol. I. FROM THE 1ST TO THE XVITH DYNASTY.
Eleventh Edition, Revised.
12*s. net.*
Vol. II. THE XVIITH AND XVIIITH DYNASTIES.
Seventh Edition, Revised. 9*s. net.*
Vol. III. XIXTH TO XXXTH DYNASTIES
Third Edition. 12*s. net.*
Vol. IV. EGYPT UNDER THE PTOLEMAIC DYNASTY
By EDWYN BEVAN. 15*s. net.*
Vol. V. EGYPT UNDER ROMAN RULE
By J. G. MILNE.
Third Edition, Revised. 12*s. net.*
Vol. VI. EGYPT IN THE MIDDLE AGES
By STANLEY LANE POOLE.
Fourth Edition. 10*s. net.*

PONSONBY OF SHULBREDE (Lord)
ENGLISH DIARIES £1 1*s. net.*
MORE ENGLISH DIARIES
12*s.* 6*d. net.*
SCOTTISH AND IRISH DIARIES
10*s.* 6*d. net.*

RUTTER (Frank)
EL GRECO
Illustrated. £1 16*s. net.*

STEVENSON (R. L.)
THE LETTERS
Edited by Sir SIDNEY COLVIN. 4 Vols. *Each* 6*s net.*

SURTEES (R. S.)
HANDLEY CROSS
MR. SPONGE'S SPORTING TOUR
ASK MAMMA
MR. FACEY ROMFORD'S HOUNDS
PLAIN OR RINGLETS?
HILLINGDON HALL
Each illustrated. 7*s.* 6*d. net.*
JORROCKS'S JAUNTS AND JOLLITIES
HAWBUCK GRANGE
Each illustrated. 6*s. net.*

TAYLOR (A. E.)
PLATO: THE MAN AND HIS WORK
£1 1*s. net.*
PLATO: TIMÆUS AND CRITIAS
6*s. net.*
ELEMENTS OF METAPHYSICS
12*s.* 6*d. net.*

TILDEN (William T.)
THE ART OF LAWN TENNIS
Revised Edition
SINGLES AND DOUBLES
Each illustrated. 6*s. net.*
THE COMMON SENSE OF LAWN TENNIS
MATCH PLAY AND THE SPIN OF THE BALL
Each illustrated. 5*s. net.*

TILESTON (Mary W.)
DAILY STRENGTH FOR DAILY NEEDS
Thirty-third Edition. 3*s.* 6*d. net.*
India Paper. *Leather,* 6*s. net.*

TRAPP (Oswald Graf)
THE ARMOURY OF THE CASTLE OF CHURBURG
Translated by J. G. MANN.
Richly illustrated.
Limited to 400 copies.
£4 14*s.* 6*d. net.*

UNDERHILL (Evelyn)
MYSTICISM 15*s. net.*
THE LIFE OF THE SPIRIT AND THE LIFE OF TO-DAY 7*s.* 6*d. net.*
MAN AND THE SUPERNATURAL 7*s.* 6*d. net.*
CONCERNING THE INNER LIFE 2*s. net.*
THE HOUSE OF THE SOUL 2*s. net.*

VARDON (Harry)
HOW TO PLAY GOLF
Illustrated. *Nineteenth Edition,* 5*s. net.*

WAND (J. W. C.)
THE DEVELOPMENT OF SACRAMENTALISM 6*s. net.*
A HISTORY OF THE MODERN CHURCH 8*s.* 6*d. net.*

WILDE (Oscar)
THE WORKS
In 16 Vols. *Each* 6*s.* 6*d. net.*
I. LORD ARTHUR SAVILE'S CRIME AND THE PORTRAIT OF MR. W. H.
II. THE DUCHESS OF PADUA
III. POEMS
IV. LADY WINDERMERE'S FAN
V. A WOMAN OF NO IMPORTANCE
VI. AN IDEAL HUSBAND
VII. THE IMPORTANCE OF BEING EARNEST
VIII. A HOUSE OF POMEGRANATES
IX. INTENTIONS
X. DE PROFUNDIS AND PRISON LETTERS
XI. ESSAYS
XII. SALOME, A FLORENTINE TRAGEDY, and LA SAINTE COURTISANE
XIV. SELECTED PROSE OF OSCAR WILDE
XV. ART AND DECORATION
XVI. FOR LOVE OF THE KING 5*s. net.*
XVII. VERA, OR THE NIHILISTS

WILLIAMSON (G. C.)
THE BOOK OF FAMILLE ROSE
Richly Illustrated. £8 8*s. net.*